ELECTRICAL WEST

PRINT IN BINDING

May 1948
25 cents

The Atom Up to Date, Page 63
Appliances, Page 94

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

sure enough!

The direct benefits of Edison advertising to you as an appliance dealer are not just happenstance. They took years of building, in constant cooperation with appliance dealers. While selling the advantages of electrical living, Edison advertisements use no brand names, so they urge the purchases of your line of quality appliances. And they never suggest availability unless dealer stocks are adequate.

Today, as appliances reappear on the market, dealers are receiving the benefits of more than fifty years of such carefully tuned promotions. It is more than ever true today that "Edison tells them and the dealer sells them." Customers look on Edison advertisements as assurances. Two ways:

1. To be *sure* the appliances are *good enough.*
2. To be *sure* that dealers *have enough.*

Edison

SOUTHERN CALIFORNIA EDISON COMPANY

EFFECTIVE APRIL 19, 1948
PRICES REDUCED 5 PERCENT

Quick Economical Attractive

G-E CAPACITOR EQUIPMENTS can be shipped in a relatively short time. Further, a 2520-kvar outdoor unit, such as pictured, is easily installed and can be in service helping you meet demands within 48 hours from the time it reaches location.

These equipments are neat, modern, attractive—are weatherproof, and have a superior weather-resisting paint finish. Each equipment is complete with Pyranol capacitor units with individual fuses, grounding switch and, where desired, air or oil breakers—with or without automatic switching. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

CAPACITOR EQUIPMENTS PROVIDE A PRACTICAL METHOD OF MEETING GROWING LOADS NOW.

G-E capacitors can help you deliver more kilowatts—right now, in a matter of weeks. This is true *even if the power factor of your system is as high as 95 per cent.*

And because they constitute the lowest-cost method of increasing the kilowatt capacity of generating plants, transmission lines and transformer banks, their importance in your long-range economic picture can hardly be overemphasized.

GENERAL ELECTRIC

407-129

MAY
1948

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S.
The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal", "Journal of Electricity, Power and Gas" and "Journal of Electricity". Contents Copyright. Sixty-first year of publication.

ELECTRICAL WEST

James H. McGraw (1860-1948), Founder
James H. McGraw, Jr., Chairman of the Board — George C. Tenney, President and Editor
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CONVENTION-IN-PRINT

For the busy who may not be able to go to a convention but can benefit from the information and the inspiration provided by one (and even those who go to a convention may take this one in too by reading) Electrical West for some years has been providing a Convention-in-Print in its June issue.

Its speakers write the messages they give to the industry. You may read them slowly or quickly, reviewing any item as often as you wish and keep the text for reference. The presidents of the three major industry associations address you. Topics of strong importance are presented by other noted authorities.

The water supply—and its power supply aspects — for the entire region, will be one such topic. The Northwest power situation looking into the next decade will be another major topic. A completely new approach to the sales and appliance end of the business, and how it shapes cooperative policy, is another promised subject. What is happening in construction costs will also be surveyed. Technological engineering advances in the West will be reviewed. The socialization of power will come under scrutiny.

In these topics there is interest in abundance for everyone in the industry.

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COVER PHOTO: Shasta Reservoir was spilling 7,800 second-feet when this picture was taken in April. Reservoir spilled 94,000 acre-feet in 7 days.

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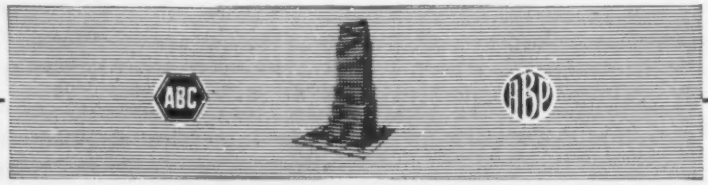

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NO. 5

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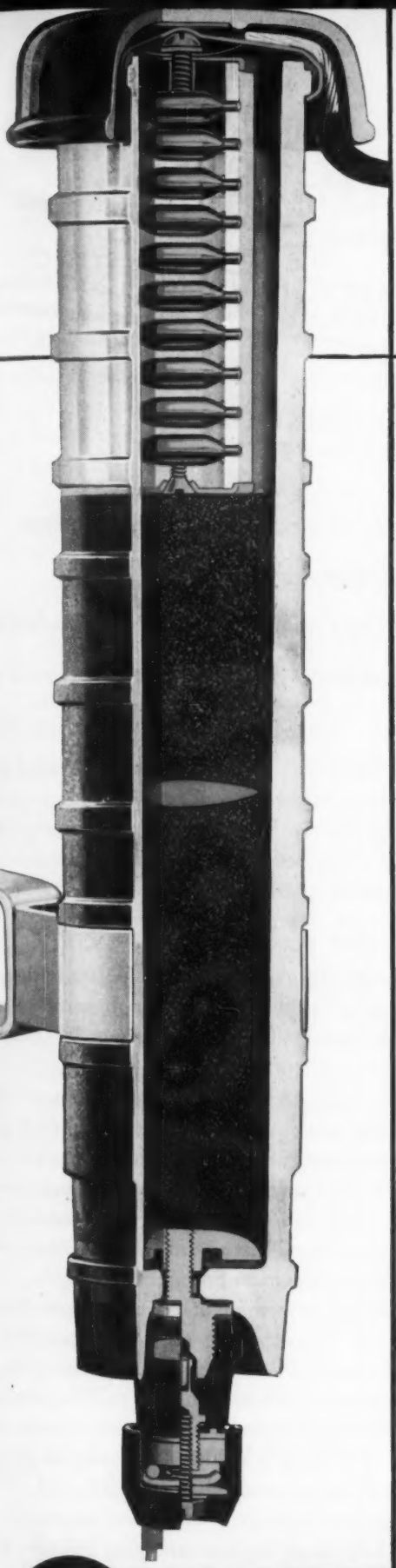
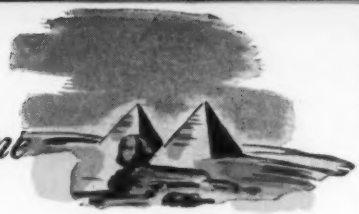


This has been going on for a long, long time



Literally millions of years of service among the hundreds of thousands in operation prove that L-M Heavy Duty valve type arresters maintain, unchanged, their ability to give unfailing protection.

L-M *Heavy Duty valve type* Lightning Arresters *give unchanging protection*

It's the way they're built! The precision spark gap maintains its low impulse sparkover value and fast action on *both* long low and *steep* front waves—because it is machined out of solid brass rod, rigidly mounted in an accurately machined steatite frame.

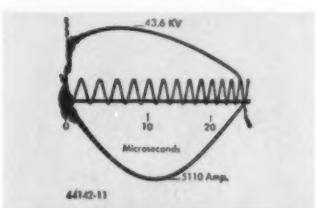
Characteristic (or valve) element is L-M "Granulon", which is chemically and electrically stable. There is nothing to break down, oxidize, char, or crumble. It is solidly molded right into the Pyrex* housing. Therefore the arrester maintains, unchanged, its original low IR drop, its high discharge capacity, its ability to keep follow current always at a point low enough to eliminate unnecessary fuse blowings and breaker operations, and to interrupt it at the first half cycle. And the ISOLATOR, an exclusive L-M patent, is extra insurance that the arrester can never (no, never!) ground feeders. No other arrester can make all these claims.

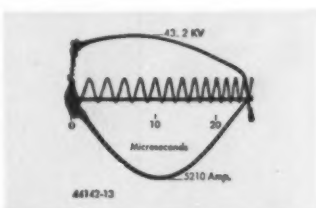
(*Reg. trademark)

Here's an easy-to-read Bulletin

The performance they give, and how they are built, in graphs, oscillograms, cross sections and other useful data in a dozen easy-to-read pages. **Write: Line Material Co., Milwaukee 1, Wisconsin.**

L-M Heavy Duty arresters are made in 1, 3, 6, 9, 12, and 15 kv sizes—amply meet AIEE and NEMA standards.





Characteristics of L-M arresters do not change. Left, before and right, after, the AIEE 30-operations test made with 5000-amp surge and 60-cycle follow current. This unexcelled protection continues throughout the long life of the arrester.

LINE MATERIAL Lightning Arresters

L-M DISTRIBUTION EQUIPMENT INCLUDES:

Distribution Transformers • Fuse Cutouts and Fuse Links • Lightning Arresters • Oil Switches • Pole Line Hardware • Line Construction Specialties • Underground Equipment • Fibre Conduit • Street and Airport Lighting Equipment • "Wired Radio" Control Equipment • Capacitors

GENERAL ELECTRIC REPORTS ON RECENT IMPROVEMENTS

Effective April 19, 1948
Prices Reduced 5 Percent

1. ***All ratings now Spirakore* design***
2. ***Sealed tanks prolong oil life***
3. ***Shielded windings, 22 kv and above***
4. ***Improved Pyranol insulating liquid***

The best distribution transformers that General Electri has ever built have been coming off our production line during the last few years. Furthermore, our productio rate has been, for several months, far greater than that o any comparable prewar period.

1. Now they are all SPIRAKORE

All General Electric single-phase distribution trans formers now use the Spirakore construction, one o the really fundamental improvements in transforme history.

The first Spirakore transformer, announced in 193 used a circular-shaped core, which decreased excitin current, permitted a radical reduction in size and weigh and resulted in lower prices. Later, a rectangular-shape core was developed, still utilizing the Spirakore desig and retaining its original advantages, but also permittin substantial improvement in impulse strength.

Basically, this method of winding cores from ste strip instead of assembling them from punchings pr duces a mechanically stronger core. Even more importa it produces a core in which the flux path is parallel wi the direction of the steel's grain. This permits, in tur the use of corisil, a cold-rolled, oriented-grain ste having superior magnetic characteristics in the directi of the grain. Spirakore transformers are small, ligh weight, have high impulse strength, and low excitin current.

**Reg. U.S. Pat. Off.*

PRINT IN BINDING

IN DISTRIBUTION TRANSFORMERS

2. *They are SEALED to prolong oil life*

All General Electric Spirakore transformers above 15,000 volts use the sealed-tank construction. In the lower voltages, this design is already being used for most kva ratings.

The sealing of tanks for the purpose of prolonging the life of insulating oil has long been a feature of G-E power transformers. Now General Electric is making sealed tanks available, for the first time, in distribution transformers.

Outside atmosphere, with its harmful moisture content, is effectively sealed out by Buna-N rubber gaskets at all openings. These gaskets, compressed against stops or, in the case of the smaller transformers, against a deep-rolled flange on the tank, form a liquid-tight joint without use of cement or gasket stickers.

3. *They are SHIELDED against lightning surges*

All General Electric Spirakore transformers, 22,000 volts and above, have shielded windings.

Shielding was first introduced in the power-transformer field by General Electric in 1926. By preventing severe concentrations of voltages within the windings, the impulse strength of high-voltage transformers has been greatly increased and failures prevented. Now General Electric provides shielding in distribution transformers in the higher-voltage ratings.

High- and low-voltage coils are concentric with each other, and with the grounded core. Insulated metal shields around the coil are connected electrically to each line lead. Surges, which otherwise might produce tens of thousands of volts between adjacent layers and turns, are so distributed as to produce only a few thousand volts—stresses which the new progressive-layer insulation can easily withstand.

4. *They are supplied with an improved PYRANOL**

All General Electric Pyranol-filled transformers are now supplied with an improved Pyranol, designated as No. 1467.

Pyranol is an insulating liquid, introduced by General Electric in 1932, which permits, under the National Electrical Code, the indoor installation of liquid-filled transformers without fireproof vaults. It is chemically stable and possesses all the necessary operating characteristics of a good insulating liquid, but unlike mineral oil, it will not form explosive or flammable gases, *and will not burn, oxidize, or sludge.*

The chemical composition of the original Pyranol has been improved so that, now, equipment insulated and cooled with the new liquid can be handled in the same way, in case of failure, as would oil-filled equipment. The principal difference, compared to the older No. 1488 Pyranol, is that the new No. 1467 neutralizes the hydrogen-chloride gas remaining in the liquid after an internal arc. This avoids any possibility of the formation of hydrochloric acid within the transformer.

NOT A DAY'S PRODUCTION LOST

These improvements, and others, have been brought to you without causing a day's loss of production; furthermore they have been a major factor in limiting price increases. The high volume of production today is in great measure possible only because of savings in critically short materials and the use of new high-speed machines that are a part of the Spirakore improvement program. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

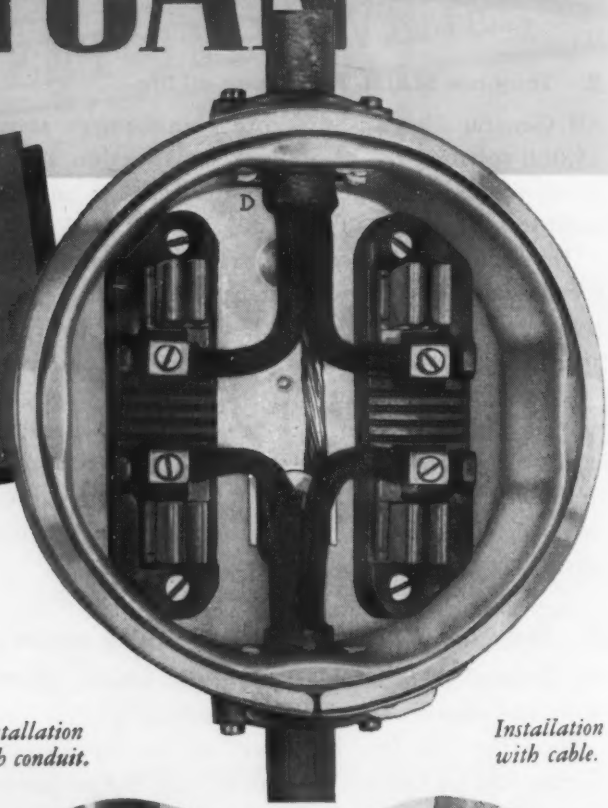
GENERAL ELECTRIC

402-TD

DUNCAN

...offers a new type meter socket

THE TYPE D *Drawn Aluminum* METER SOCKET

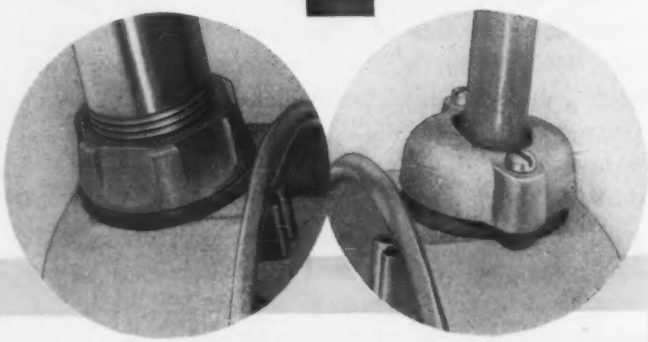


DO YOU NEED SOCKETS IN A HURRY?

DESPITE continued heavy demand for Duncan Type D Sockets, current delivery schedules are good. If you have to have sockets in a hurry, call, write or wire your local representative or Duncan at Lafayette.

Installation with conduit.

Installation with cable.



IMPROVED SERVICE CONNECTIONS. The Type D socket is supplied with two knockouts to provide a simple, economical and superior device for use with service cable. The best water-tight cable connection can be made using a knockout and suitable standard fittings now available. Fittings are also available for making water-tight conduit connection to the Type D socket.

STRUCTURALLY STRONG, RIGID. Though light in weight, the structural shape has been worked out to provide exceptionally high strength.

SUPERIOR CORROSION RESISTANCE. Drawn from 52S ½ hard high grade aluminum. Satin finish.

SEALING RING. Supplied with Duncan one piece, rapid-change type sealing ring. Same aluminum stock as socket.

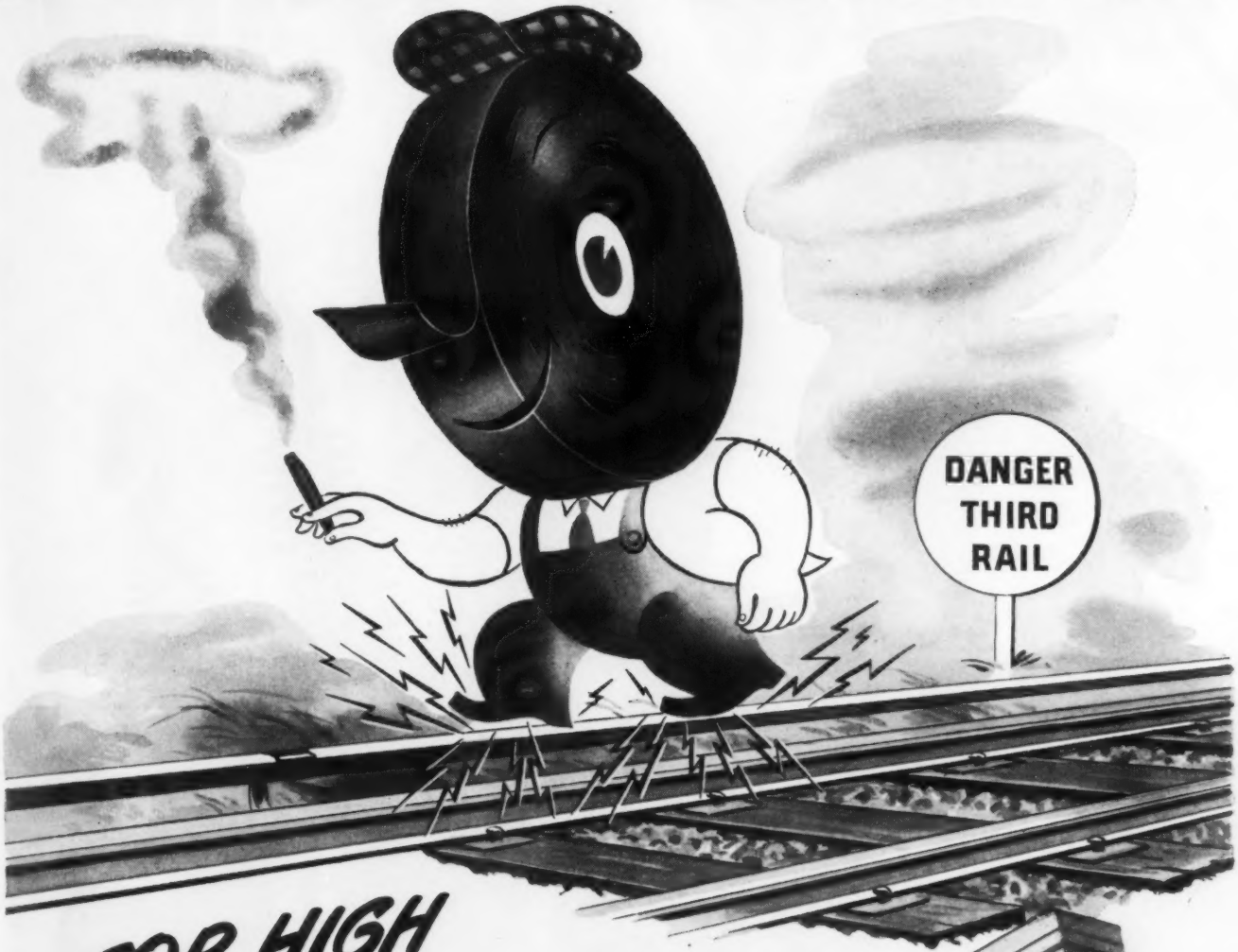
SIMPLIFIES STOCKING. Suitable for more than thirty practical combinations of conduit and cable, using cable from 2/#8 to 3/#2 and conduit from ½ inch to 1¼ inch. Supplied for vertical mounting but may readily be changed to horizontal installation by simply rotating switch jaw terminals. Back or side outlets may be punched as needed. The side outlets may be punched after installation when necessary.

DUNCAN ELECTRIC MFG. CO.

Lafayette Indiana

UNITED STATES RUBBER COMPANY

SERVING THROUGH SCIENCE



FOR HIGH DI-ELECTRIC STRENGTH

Pick Security Friction Tape

High di-electric strength for high voltage jobs, plus strong rubbery adhesive with a terrific grip . . . that's Security Friction Tape. And Security has no pin holes, does not unravel when unwound from the roll. For electrical and general purpose jobs, big or little, you'll find straight-tearing, highly-insulating Security a tape you can trust.

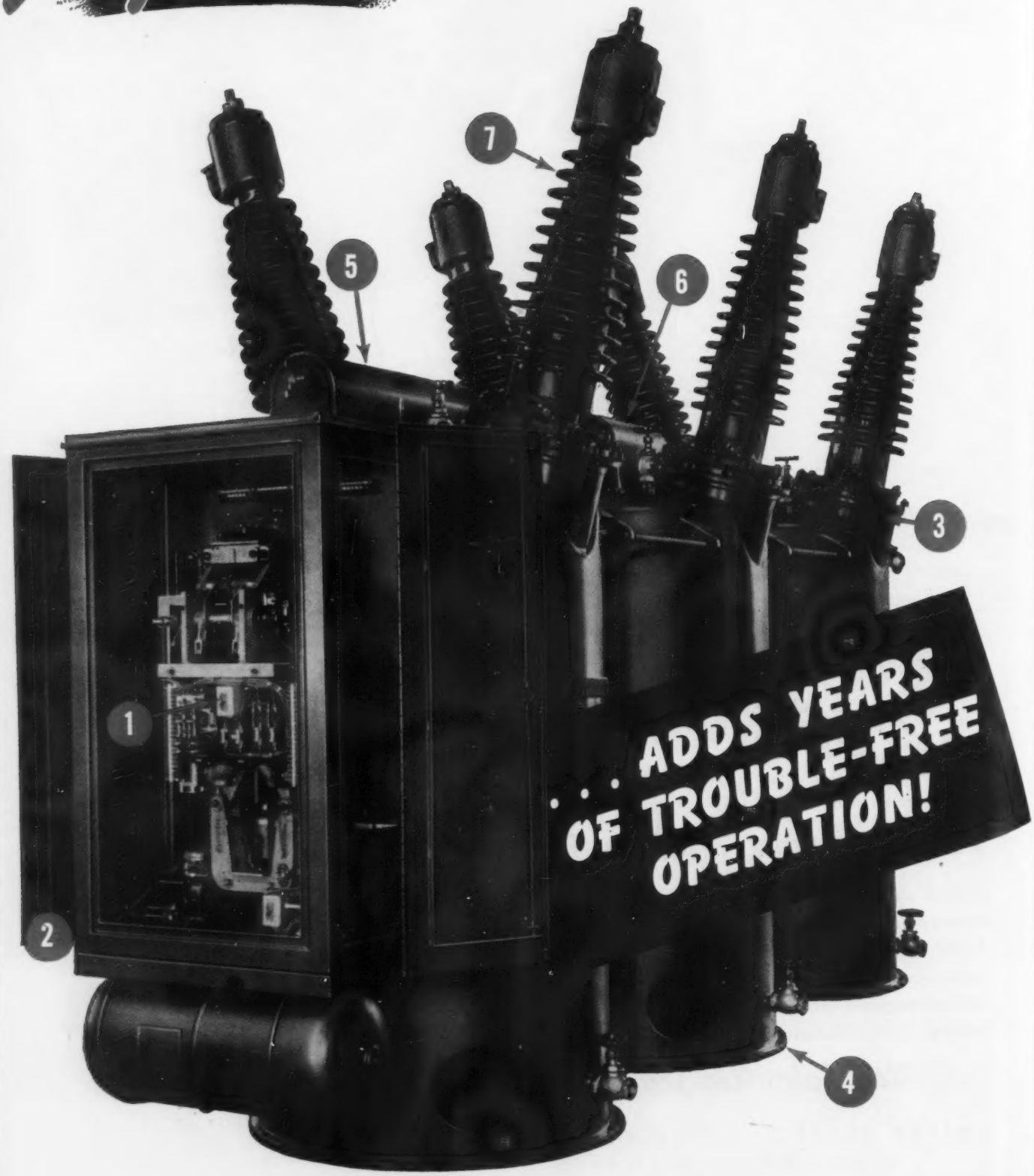
Play Safe—Use Security

UNITED STATES RUBBER COMPANY

1230 Avenue of the Americas, New York 20, N. Y.

ALLIS-CHALMERS

Improved BZO-160



Oil Circuit Breaker

1. MECHANICALLY TRIP-FREE pneumatic operator provides 20-cycle reclosing.
2. WEATHERPROOF CABINET with 2 double-hinged doors . . . permits complete accessibility on 3 sides.
3. BUSHING TRANSFORMERS removable from top or bottom of wells.
4. EXTENDED TANK WALLS protect dome bottom . . . provide flat base for installation.
5. WEATHERPROOF HOUSING protects pole unit mechanism and transformer taps.
6. SMOOTH, STREAMLINED top and housing eliminates corrosion-inviting crevices.
7. SEALED BUSHING types embody high electrical and mechanical standards of safety and low maintenance cost.

ASK FOR COMPLETE STORY of BZO-160 oil circuit breakers — furnished in ratings 115 kv and higher; with interrupting capacities up to 3,500,000 kva; circuit interruption within 5 cycles, reclosing service within 20 cycles.

Ruptor is an Allis-Chalmers trademark

MAINTAIN YOUR STANDARDS of service with "5-20" performance . . . interruption in 5 cycles, reclosing in 20! You get *that* protection in ratings 115 kv and higher by installing Allis-Chalmers *improved* BZO-160 oil breakers.

REDUCES CONTACT MAINTENANCE

TWO SINGLE-BREAK RUPTOR interrupters assure fast, positive interruption . . . *within 5 cycles!* They are based on standard A-C design backed by years of service . . . known for low arc energy circuit interruption that means long contact life and low oil deterioration. Simple construction, free of complicated mechanisms and serious alignment problems, permits quick contact inspection.

IMPROVED HIGH SPEED PNEUMATIC OPERATION, with fast magnetic trip, aids high speed contact separation . . . provides 20-cycle reclosing that helps you maintain better service continuity and system stability. It is *mechanically trip-free* . . . assures instantaneous reopening should breaker close on a fault!

BUILT FOR LONG LIFE

CAREFULLY SELECTED MATERIALS for all parts, from tanks to contacts, minimize chance for mechanical failures. Number of routine inspections per year is reduced by liberal Allis-Chalmers construction.

ALL-AROUND WEATHERPROOFING protects mechanisms . . . prevents deterioration.

For more complete information on the BZO-160 outdoor oil breaker, contact your nearby A-C office for literature, or write ALLIS-CHALMERS, MILWAUKEE 1, WIS.

A 2346

Call Allis-Chalmers for circuit breakers—Indoor 2.5 to 34.5 kv... up to 1,500,000 kva: Outdoor 7.5 to 230 kv...up to 3,500,000 kva.

ALLIS-CHALMERS

Pioneers in Power and Electrical Equipment From Generation Through Utilization

SYLVANIA *introduces* ONE-YEAR GUARANTEE *on* Fluorescent Fixtures

FOR the first time in the history of fluorescent lighting, Sylvania Electric offers its customers not only the highest quality fixtures, but *guaranteed** packages of light as well!

Another Sylvania "first," this one-year guarantee is indicative of the confidence Sylvania has in every component part of the fixtures it manufactures.

The same leadership and skill that have made such an unprecedented guarantee possible are responsible for Sylvania's equally outstanding achievements in the fields of Radio, Television, FM and Electronics.

SYLVANIA ELECTRIC

**Complete information concerning this guarantee, which applies on installation of 100 or more units in one location, available on request.*

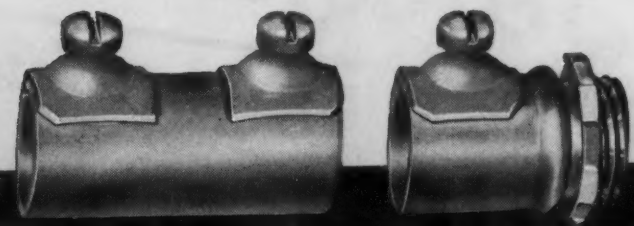
ALL PRODUCTS MADE BY SYLVANIA ELECTRIC CONSUME ENERGY—MORE THAN 10,400,000,000 KWH PER YEAR

WEST COAST DIVISION OFFICES: LOS ANGELES, SAN FRANCISCO, SEATTLE

NEW IMPROVED—

National Electric FITTINGS for EMT

(Electrical Metallic Tubing)



EASY TO INSTALL

IN CLOSE QUARTERS AND CORNER LOCATIONS!

You'll like these greatly improved Connectors and Couplings for thin-wall tubing.

15 outstanding advantages!

- Uniform Installation Throughout Job
- Permanent Ground
- Vibration Proof
- Conduit Stops
- Easy to Inspect
- Installed With a Screwdriver
- No Wrench Strains on Boxes
- Positive Holding Action
- Simple, Strong, Pressed-Steel Construction
- Electro-Galvanized Throughout
- Approved by Underwriters' Laboratories, Inc.
- Close, Accurate Fit
- One-Piece Body
- Economical
- Re-Usable

Sold Through Leading Electrical Wholesalers

NATIONAL ELECTRIC PRODUCTS — WIRING SYSTEMS — WIRES AND CABLES

XDUCT JUNIOR

Steel for Permanence — Grounded for Safety!

National Electric Products Corporation
Pittsburgh 30, Pa.

UNION PACIFIC

The Governor of Utah *invites You*

STATE OF UTAH
OFFICE OF THE GOVERNOR
SALT LAKE CITY

HERBERT B. MAW
GOVERNOR

To American Industry:

The State of Utah takes pleasure in presenting to American Industry an opportunity for new development and expansions.

The State of Utah prides itself on the quality of its people, the tremendous extent and ready availability of its raw materials, its unlimited power resources, its unequaled transportation facilities, and its friendly attitude toward business.

These factors, together with the advantages of living under ideal home surroundings in the nation's most interesting area, has already induced many fine industries to locate in our State.

A new industrial economy is developing in our commonwealth based on the substantial foundations of the basic materials available and the happy and contented people constituting the human resources.

The establishment of your business in Utah will give you an opportunity to share in this new industrial economy and to participate in the growth already experienced in the west.

Sincerely yours,

Governor

Herbert B. Maw

* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska

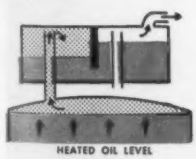
UNION PACIFIC RAILROAD

Road of the Daily Streamliners

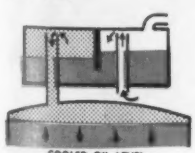
24 Years of Protection

AGAINST MOISTURE AND OXYGEN!

A PRINCIPLE — Transformer cooling oil is isolated from the atmosphere by inert gas and oil seal. This prevents sludge formation and fire hazard due to oxygen. Excluding moisture maintains high dielectric quality of oil.



B AS TRANSFORMER HEATS, the cooling oil expands, displacing inert gas from main tank to auxiliary tank. The transfer of gas is cushioned by the change of oil levels as shown, keeping the main tank pressure low.



C AS TRANSFORMER COOLS, the reverse takes place. In this simple manner inert-gas protection is provided automatically . . . transformer oil adjusts itself to changing temperatures without being exposed to the atmosphere.

Simple Then, and Still the Simplest Available, "Oil-Sealed" Inert Gas Systems are Standard for Over 5,000,000 kva of U.S. Power!

IT'S NOT OFTEN a manufacturer can build a product and keep its design for 24 years, but that's exactly what A-C has done with its "Oil-Sealed" inert gas system. And the reason can be summed-up in one word . . . SIMPLICITY.

This remarkable system has no moving parts . . . no sensitive gauges or reduction valves. It does not require periodic replenishment of nitrogen; there are no bottles to buy!

Proof? These *original* 18 systems are still operating satisfactorily after 24 years! Additional proof is the steadily increasing popularity and demand for the "Oil-Sealed" inert gas systems! The fact that A-C pioneered in this field has much to do with inert gas protection as a *standard* today!

The "Oil-Sealed" system is the *lowest pressure* system available — generally not over 1 lb. per sq in. — resulting in low gasket pressure, lower gasket maintenance. Can be top-of-tank or side-mounted. ALLIS-CHALMERS, MILWAUKEE 1.

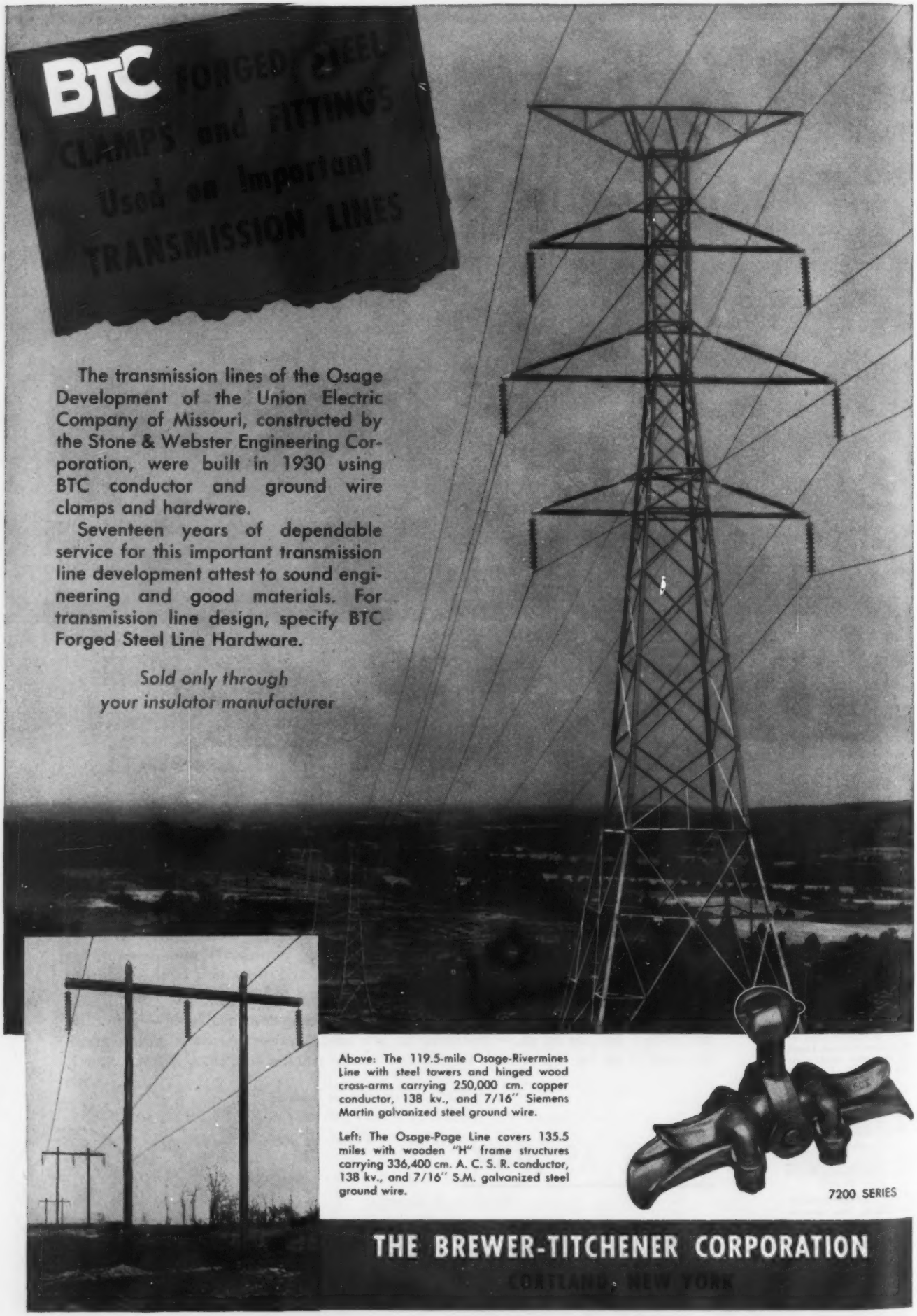
A 2355

"Oil-Sealed" is an Allis-Chalmers Trademark

SIMPLE AS A·B·C

ALLIS-CHALMERS

Originators of the "Oil-Sealed" Inert Gas System!



The transmission lines of the Osage Development of the Union Electric Company of Missouri, constructed by the Stone & Webster Engineering Corporation, were built in 1930 using BTC conductor and ground wire clamps and hardware.

Seventeen years of dependable service for this important transmission line development attest to sound engineering and good materials. For transmission line design, specify BTC Forged Steel Line Hardware.

Sold only through your insulator manufacturer

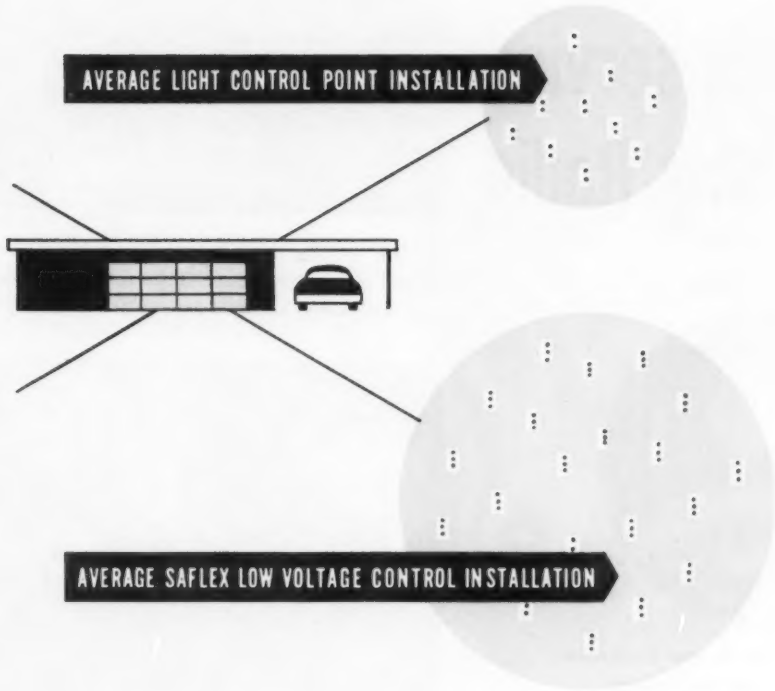
Above: The 119.5-mile Osage-Rivermines Line with steel towers and hinged wood cross-arms carrying 250,000 cm. copper conductor, 138 kv., and 7/16" Siemens Martin galvanized steel ground wire.

Left: The Osage-Page Line covers 135.5 miles with wooden "H" frame structures carrying 336,400 cm. A. C. S. R. conductor, 138 kv., and 7/16" S.M. galvanized steel ground wire.

7200 SERIES

THE BREWER-TITCHENER CORPORATION

CORTLAND, NEW YORK



SAFLEX MEANS MORE CONVENIENCE FOR THE HOME OWNER

A BETTER JOB FOR THE CONTRACTOR

A light control point at every entrance to every room is the SAFLEX answer to home lighting. This low voltage control means a bigger job for the contractor... better light control for the home owner. The same system is readily adaptable to master control lighting.

Prevent L. S. G. (LIGHT SWITCH GROPING)..... SAFLEX LIGHTS THE PATH AHEAD

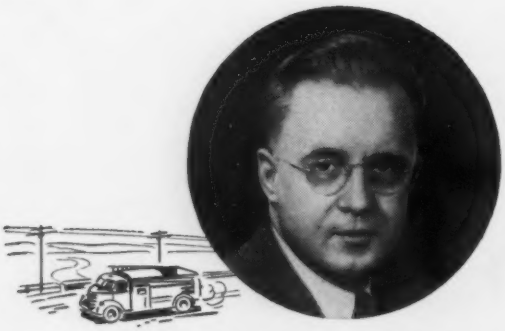
SQUARE D COMPANY

DETROIT · MILWAUKEE · LOS ANGELES

SQUARE D CANADA, LTD., TORONTO, ONTARIO • SQUARE D de MEXICO, S.A., MEXICO CITY, D.F.

BIGGER rural loads BETTER urban service with G-E 2-Way Radio

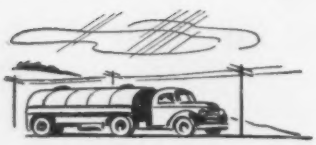
G-E mobile installation fits neatly into trunk of supervisor's cars. Note control panel below dashboard. Neat, rubber-covered handset wire coils compactly when not in use.



W. S. WILDER—Technical Assistant to Chief Electrical Engineer, Wisconsin Electric Power Company

"G-E radio gives us fast, dependable communication for critical maintenance work. This means better service for our customers at all times."

At G-E remote control console in headquarters, A. P. Schupmehl, Supervisor, sends out a call to cars.



Transmitter house and 260-foot FM antenna tower on hill near Milwaukee. High ground and lofty reach of this antenna gives station maximum range for the area. Transmitter is G-E FM 250-watt.

• The Wisconsin Electric Power Company serves Milwaukee and nearby cities. The company also distributes power through its feeder lines to hundreds of farms in the Dairy State. Today Wisconsin farmers are using more and more electricity daily for milking, separating and processing of dairy products.

To keep rural lines open, utility service trucks are on the alert at all hours. General Electric 2-way radio in these vehicles saves valuable time, permits dispatching to critical points instantly, easily, in any weather.

Electrical utilities throughout the United States and Canada put their confidence in G-E communication equipment.

General Electric will provide a complete radio system to fit your requirements—to help you give best service to your utility customers.

For complete information on 2-way mobile radio, call the General Electric office nearest you, or write: *General Electric Company, Transmitter Division, Electronics Park, Syracuse, N. Y.*

LEADER IN RADIO, TELEVISION AND ELECTRONICS

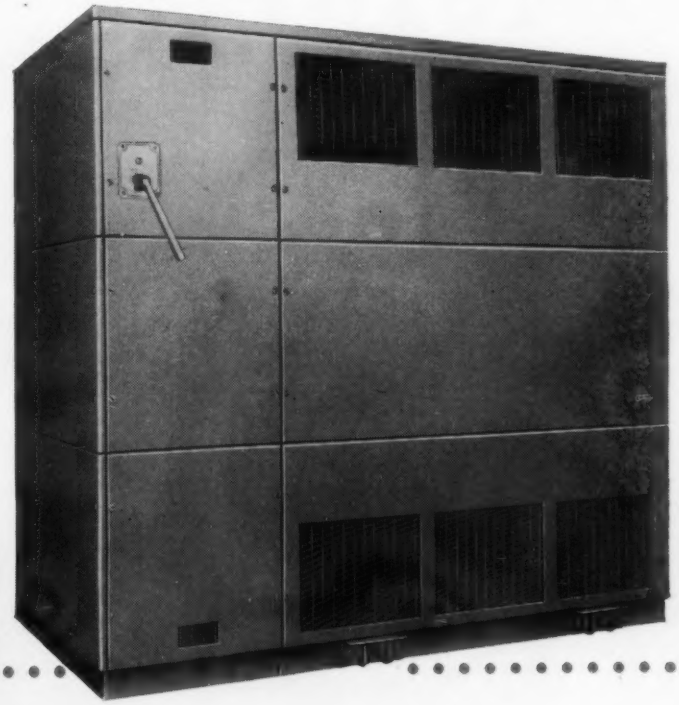
GENERAL ELECTRIC

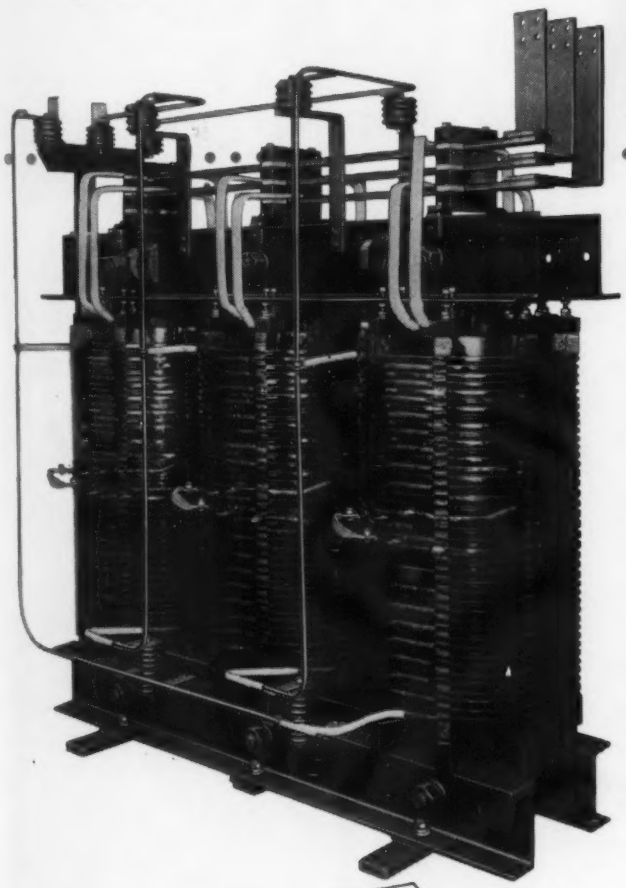
163-G2U-6918

Wagner Dry-Type Indoor Transformers

Now available in ratings from 100 to 2000 kva

To meet industry's growing need for larger indoor dry-type load center transformers, Wagner has broadened its line of three-phase dry-type transformers to include ratings up to 2000-kva in the 15-kv class and below. Especially developed for plant power distribution circuits, these units are compactly housed in neat, attractive enclosures, which can be arranged to include primary and secondary switchgear compartments to form readily accessible, closely-coupled unit substations. Complete enclosure of all equipment protects against accidental contact with live parts. Relatively light in weight, so that they can be used in multi-story buildings, they are readily adaptable to any installation requirement.





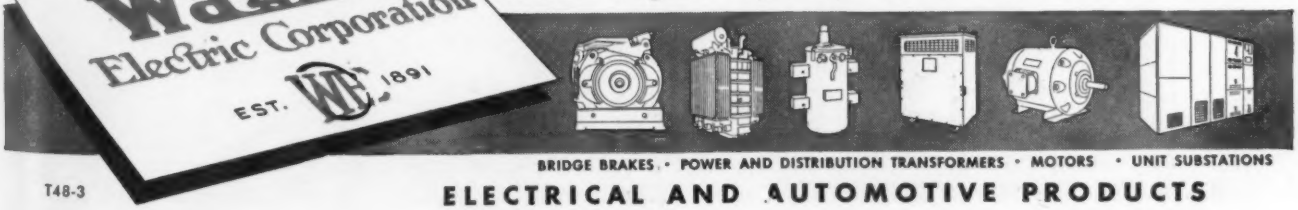
More than fifty years of transformer building experience has been incorporated in the design and construction of these transformers. The coil conductors are insulated with double servings of fiber glass. The windings are insulated from each other and from the core and mechanical parts using Class B and Class C materials, the latter being employed where extra strength is required. The core is sturdily constructed, and both the core and the coil stacks are provided with vertical ducts for effective cooling. The entire core and coil assembly is given successive baked coats of heat resistant synthetic varnish which produces a tough, high gloss finish. The connections between phases and to the switch gear are securely braced and well insulated from each other and from ground, and the conducting surfaces of all clamped joints are silver plated to prevent corrosion.

Transformers can be furnished with equipment for indicating winding temperature. Fans for increasing the capacity 25% may also be provided when the possibility of load growth warrants this addition.

Bulletin TU-56 describes in detail the transformers, the enclosures, the various types of incoming line sections available, and the optional equipment and accessories that can be furnished. Write for your copy today.

Wagner Electric Corporation
6381 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

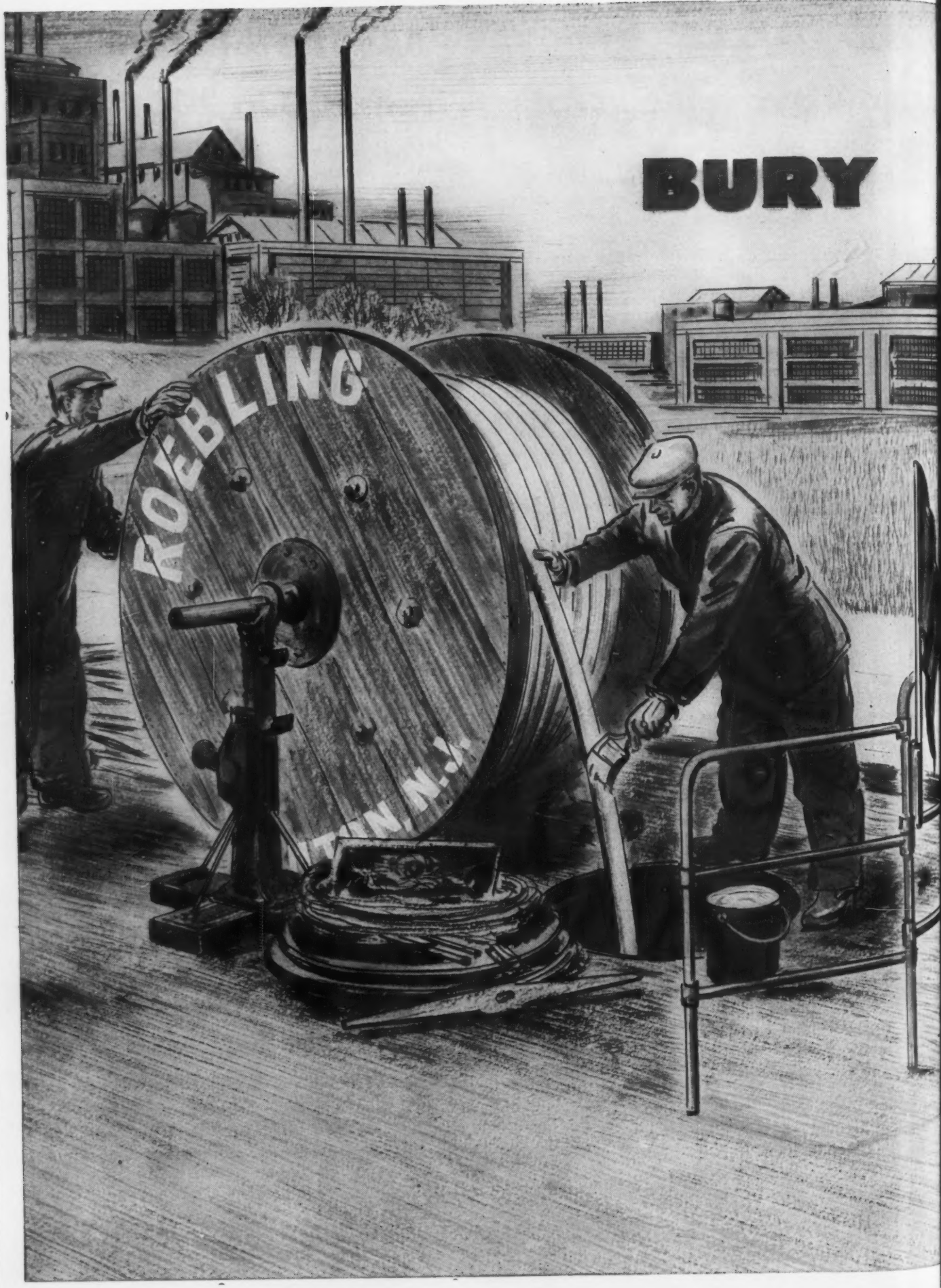
Consult Wagner Engineers on All Transformer Problems



BRIDGE BRAKES • POWER AND DISTRIBUTION TRANSFORMERS • MOTORS • UNIT SUBSTATIONS

T48-3

ELECTRICAL AND AUTOMOTIVE PRODUCTS


BURY
ROEBLING

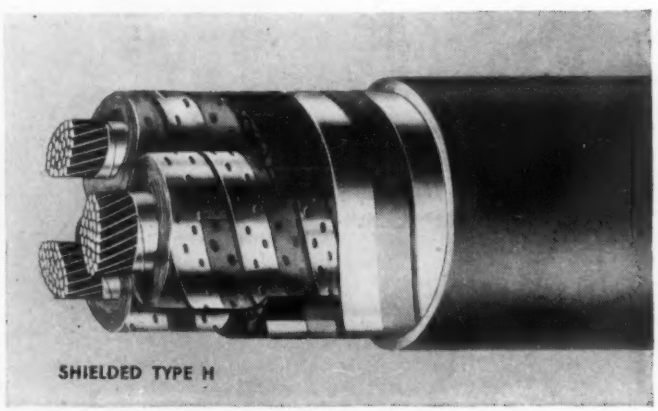
YOUR TROUBLES

GET RID OF OVERHEAD LINES and you get rid of exposure to storms and weather, costly maintenance and unsightliness. With Roebling Paper Insulated Lead Encased Cables your transmission, distribution and service circuits go underground . . . give you dependable, uninterrupted service at lowest obtainable cost.

Roebling Shielded Type H is being widely adopted for 3-phase grounded neutral circuits from 13 to 33 kv. This solid type cable is available both single and multiple conductor construction, in regular and Compack strand (round or sector). Conductors, shielded with metallized paper, are then individually insulated, protected with a perforated copper shielding tape, and the whole assembly served with a bronze binder tape. The finest materials plus Roebling engineering and production techniques give Shielded Type H characteristics of high importance in the utility field.

For a standard power cable or one manufactured for individual requirements, specify Roebling . . . your assurance of dependability and long-term low cost. A Roebling Field Man will be glad to help you select the *right* cable for specific service. Call him at our nearest branch office.

JOHN A. ROEBLING'S SONS COMPANY
OF CALIFORNIA
San Francisco • Los Angeles • Seattle • Portland



SHIELDED TYPE H

★ *WIRE ROPE AND STRAND* ★ *FITTINGS* ★ *SLINGS* ★ *SUSPENSION BRIDGES AND CABLES* ★ *AIRCORD, AIRCORD TERMINALS AND AIR CONTROLS* ★ *AERIAL WIRE ROPE SYSTEMS* ★ *ELECTRICAL WIRE AND CABLE* ★ *SKI LIFTS* ★ *HARD, ANNEALED OR TEMPERED HIGH AND LOW CARBON FINE AND SPECIALTY WIRE, FLAT WIRE, COLD ROLLED STRIP AND COLD ROLLED SPRING STEEL* ★ *SCREEN, HARDWARE AND INDUSTRIAL WIRE CLOTH* ★ *LAWN MOWERS*

ROEBLING

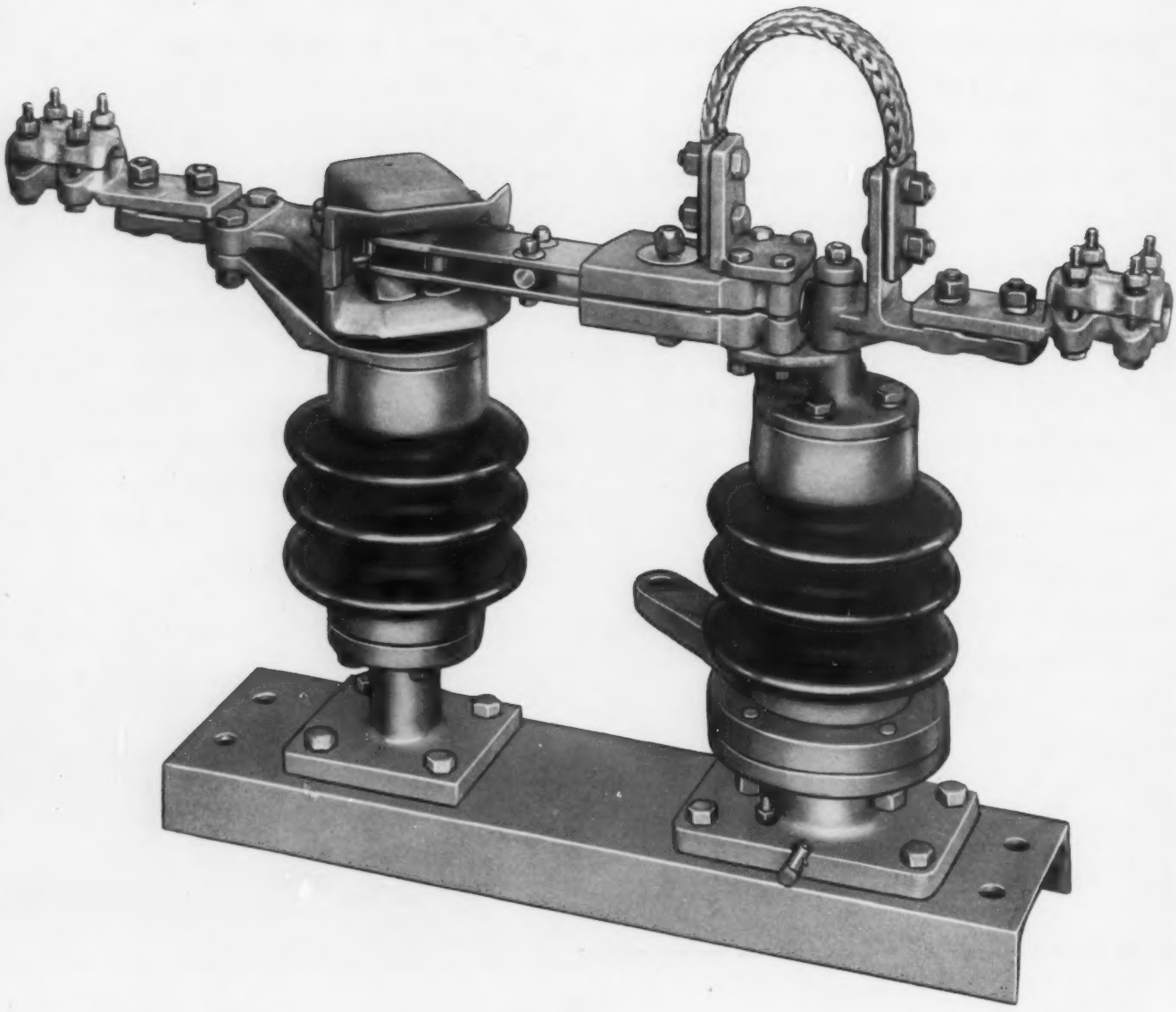
A CENTURY OF CONFIDENCE

JR ROEBLING

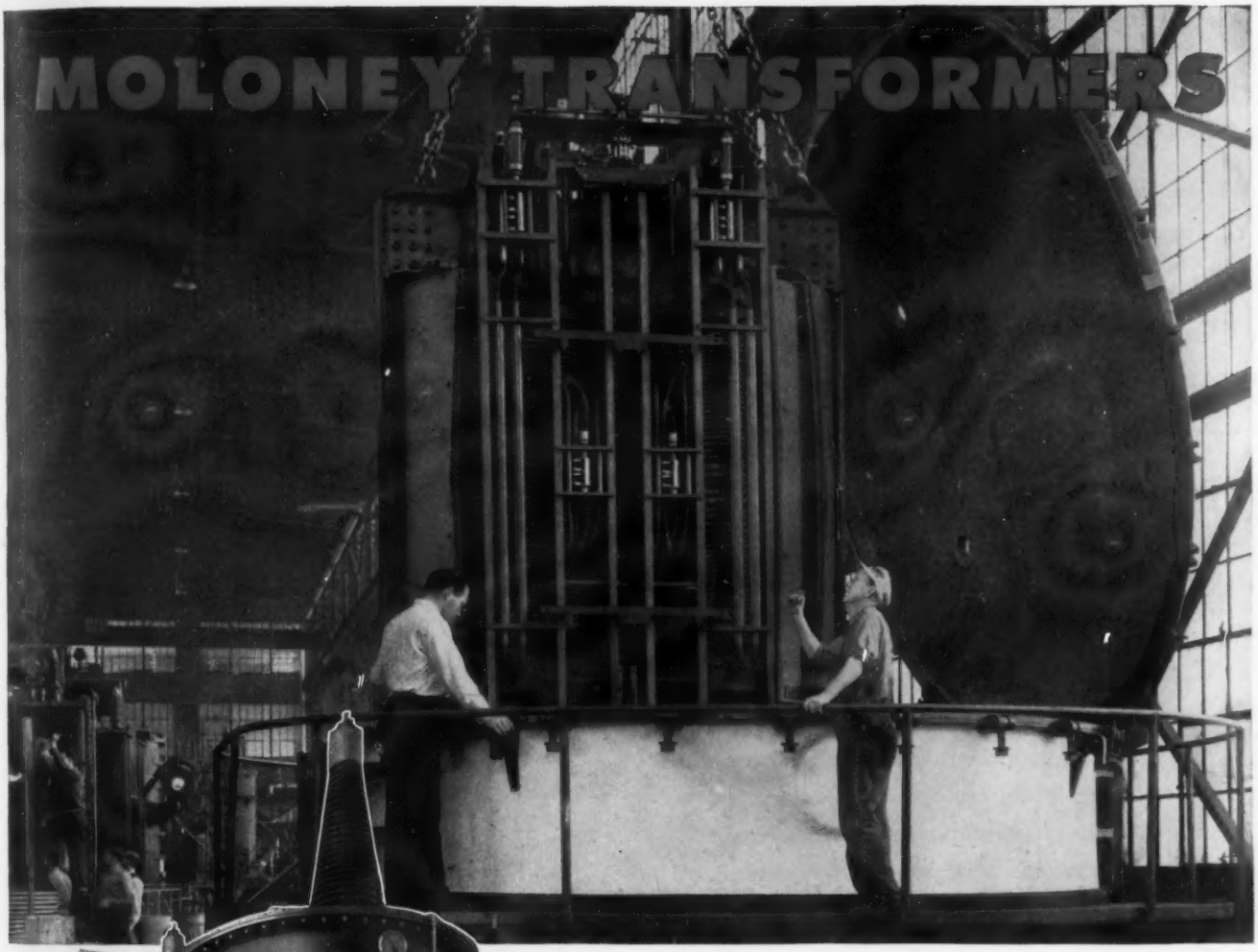
Cole Electric Co.

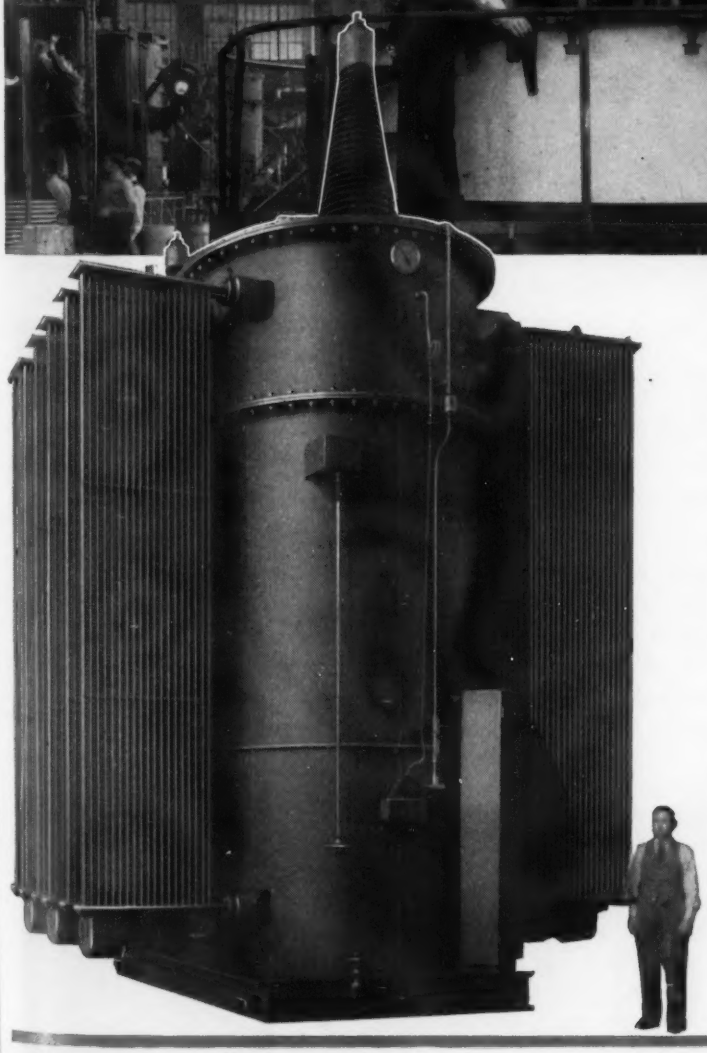
8439 Steller Drive Culver City, Calif.

TExas 0-3243



OUTDOOR DISCONNECTING SWITCH
7500 Volts 600 Ampere Type LU
Three Pole, Single Side Break
Group Operated
(1 pole shown)





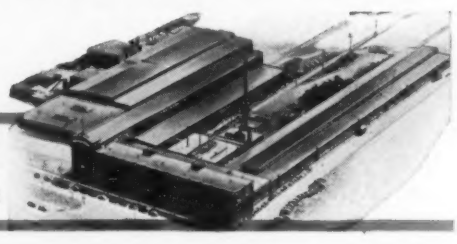
JUST ONE STEP . . . BUT *IMPORTANT*

VACUUM TREATMENT—Atmospheric moisture in insulating materials used in transformers reduces their dielectric and impulse strength. Amounts of moisture insufficient to cause breakdown on standard applied-potential and induced-potential tests may cause insulation failure under impulse conditions to which the transformer is normally subjected. Because Moloney recognizes the extreme importance of this step in production, core-and-coil units of all Moloney Transformers must be absolutely dry before they are placed in their tanks.

As illustrated above, units are placed in one of a battery of vacuum tanks. First, heat is applied by means of steam coils, evaporating some of the moisture. Then the air is removed from the tank and high vacuum maintained until test readings show the core-and-coil unit to be dry.

This is but one of the many important steps in the manufacture of Moloney Transformers. Operating records of these transformers are ample evidence of careful attention to all details of design, fabrication, and processing by an organization devoted entirely to the manufacture of but one product . . . transformers.

At left is a 28,000 KVA, single-phase power transformer, 161,000 volts primary, 13,200 volts secondary.



MOLONEY ELECTRIC CO. ☆ ST. LOUIS 20, MO.

POWER AND DISTRIBUTION TRANSFORMERS EXCLUSIVELY SINCE 1896

Rome RoZone

WHERE HIGH VOLTAGES ARE A PROBLEM

500,000 CM stranded single conductor RoZone insulated, shielded, RoPrene sheathed, power cable....5000 volts

RoZone, the superior ozone-resistant insulating compound, did not just happen . . . it is the result of intensive research and development by "Rome" technicians. Behind it is the accumulated "know-how" of men long-experienced in cable design working with modern and completely equipped facilities.

As an oil-base type compound, RoZone combines exceptional resistance to corona action with high electrical stability in water and long life. It exceeds all requirements of ASTM specification D 574, as well as other severe performance specifications. Specifically, cables insulated with RoZone are unexcelled for high voltage underground or aerial distribution circuits, series street lighting installations, or any high voltage requirement, as well as general purpose wiring *where consistently high quality is a factor.* For circuits of 8000 volts or less between phases and operation at conductor temperatures up to 75° C., RoZone insulation will give you a *new standard* for uninterrupted service and long life. You can specify RoZone with confidence.

COMPARE THESE TEST RESULTS

1. AGING. No appreciable deterioration after exposure to heat or oxidation.
2. INSULATION RESISTANCE. Several times in excess of the ASTM megohm-constant requirement of 2000. Rome Cable has established the standard megohm-constant for RoZone at 5280.
3. DIELECTRIC STRENGTH. Actual long-time test results on RoZone insulation, for 5000 volt services, exceed 400 volts per mil. Surge or impulse strength values of RoZone are equally high.
4. OZONE RESISTANCE. Practically unaffected by exposure to corona or other ozone generating conditions.
5. DIELECTRIC LOSS. Typical test values indicate a power factor less than 4. percent and a dielectric constant under 4.5.
6. ELECTRICAL MOISTURE RESISTANCE. RoZone possesses remarkable stability after long-time immersion periods as exemplified by only minor changes in its electrical characteristics.

RoZone insulation is available in either shielded or unshielded construction with RoPrene (Neoprene) sheath or other conventional coverings to your specification.

Send for your copy of RoZone specification data today. In it you will find complete electrical and physical characteristics, as well as results of competitive independent laboratory tests. See for yourself why RoZone is specified by leading utilities and industrials.

FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION

ROME • NEW YORK

PACIFIC ELECTRO SALES, INC., Pacific Coast Agents

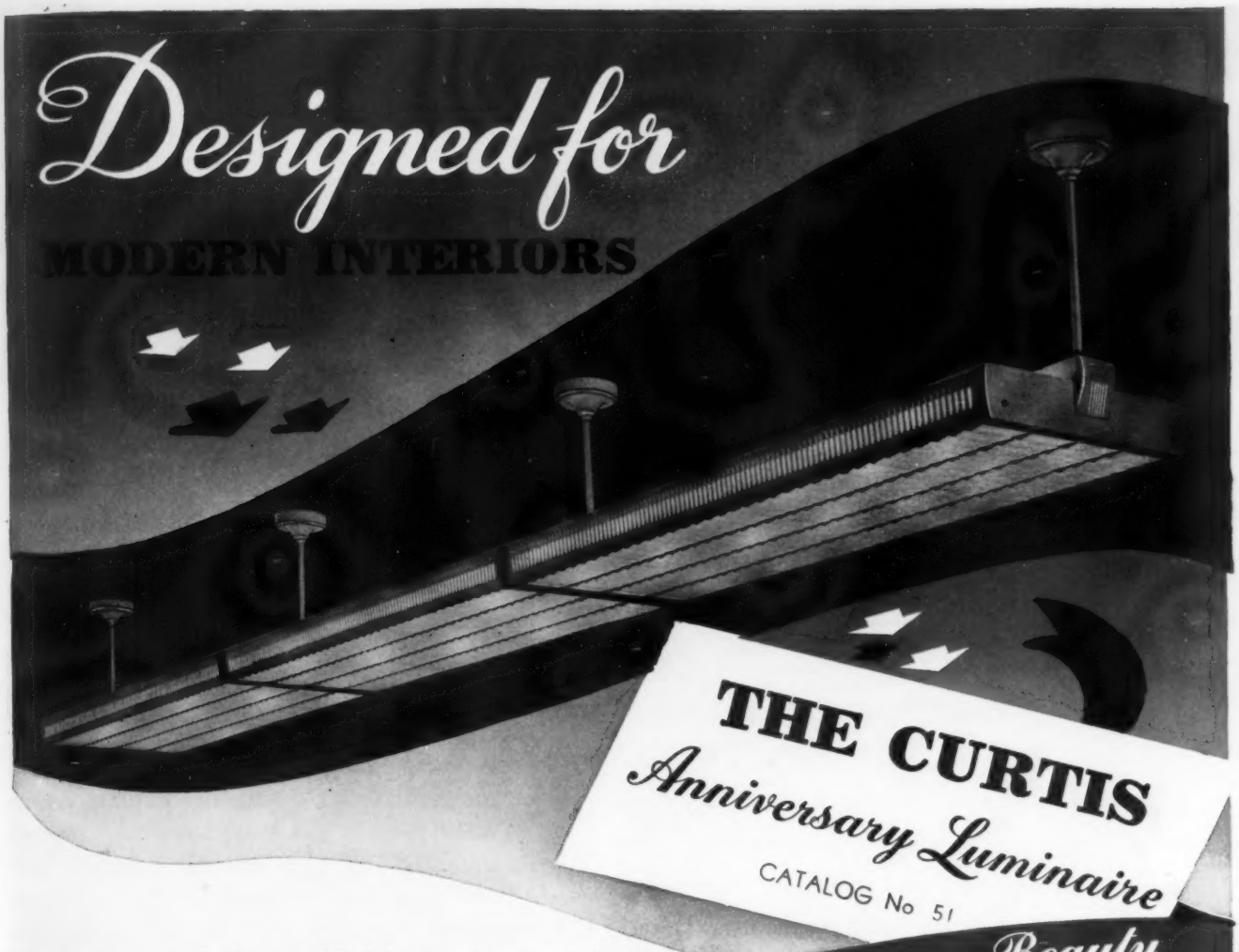
SALT LAKE CITY 1, UTAH
419 Beneficial Life Bldg.

PORTLAND 9, OREGON
1233 N. W. Twelfth Street

LOS ANGELES 13, CALIF.
340 Azusa Street

SAN FRANCISCO 3, CALIF.
1045 Bryant Street

SEATTLE 4, WASH.
1054 Fourth Ave., So.



DISTINCTIVE *Beauty*

FUNCTIONAL *Design*

SMOOTH *Illumination*

FLEXIBILITY IN *Application*

Your customer, the buyer of lighting equipment, is looking for a unit which will modernize his premises, provide smooth glareless illumination, and trouble-free operation. The electrical trade wants a unit that is easy to sell, to handle and install and which will give customer satisfaction with repeat orders.

Curtis is confident that the new "Anniversary" Luminaire will meet all these tests.

Primarily designed for modern stores where its clean graceful lines and crisp appearance are sure to make an immediate hit. Its lighting characteristics make it suitable also, for modernization of office lighting. A high indirect component (approximately 60%) plus adequate shielding of the direct component makes for ideal seeing conditions.

Mechanical construction is lightweight but rugged and practical, while the absence of horizontal reflecting or diffusing surfaces which might collect dust, insures low maintenance costs. *For 4-40 watt lamps.*

Complete data is yours for the asking. Write today.

CURTIS *Lighting*, INC.

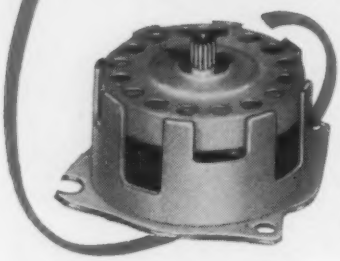
6135 WEST 65TH STREET, CHICAGO 38, ILLINOIS

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION NEMA MEMBER

Certified FLEUR-O-LIER CERTIFIED In accordance with Test Requirements of Fleur-O-Lier Manufacturers

ELECTRICAL TESTING LABORATORIES, INC. NEW YORK

New hysteresis-type motor makes SANGAMO TIME SWITCHES *Better than ever....*



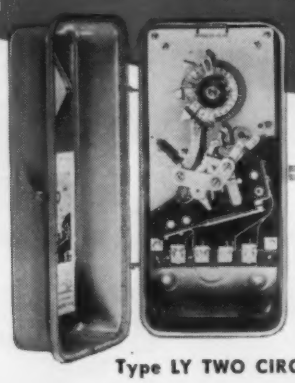
The new low-speed Sangamo-developed, hysteresis type motor—the *heart* of the time switch—achieves higher torque, both in starting and synchronous operation. The motor coil is completely enclosed in a molded shell for superior insulation. A new replaceable bearing system is lubricated with a special Silicone product which is not affected by extremes of temperature. The features of this new motor—greater torque . . . long-life lubrication . . . low speed: 450 RPM—assure exceptionally long life without attention.

New Attractive Case . . . New Shorter Intervals

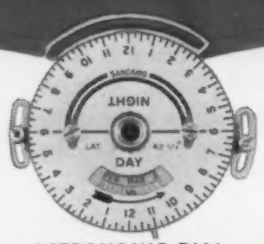
The well-designed, gray-enameled case is made of pressed steel and is provided with a weather-proof gasket and a sealable hasp. A diamond-shaped window improves visibility. Increased space for wiring and four multiple knockouts make installation easy.

Closer time-limits between settings permit a wider range of applications. The minimum time between settings of the "off" and "on" periods is 90 minutes. The time interval between "on" and "off" periods is 30 minutes. The switch can be manually tripped at any time without disturbing the automatic operation.

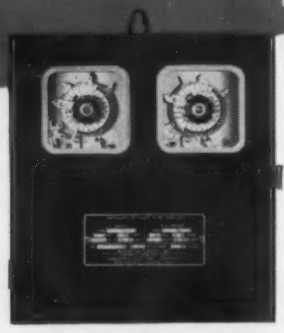
The new, improved construction is also available in the complete synchronous-motor-operated line of Sangamo Time Switches, including socket and astronomic types.



Type LY TWO CIRCUIT



ASTRONOMIC DIAL



Type LD DUPLEX

SANGAMO

SANGAMO

ST485

Type L (Synchronous)
$23.00 LIST
TRADE DISCOUNTS APPLY

Type WH
(Synchronous Carryover)

angamo Time Switches, widely known for their ependability, are now better than ever! The Type synchronous and the Type WH synchronous arryover switches, pictured above are the two ew basic time switch units in the Sangamo line. hey can be adapted to a wide range of applica- ons by the inclusion of an omitting device, advance time cutoff, astronomic dial, and two circuit type construction.

These improved Sangamo Heavy-Duty Time Switches are available for immediate delivery.

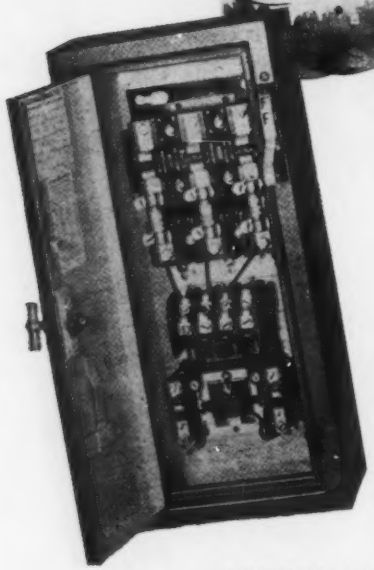
Bulletin 1060N gives full information and prices. A copy will be sent upon request.

ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS

THESE MODERN G-E CONTROLS PROTECT PERSONNEL...MOTOR AND LOAD

INDUSTRIAL CONTROL



providing safeguards against overloads, undervoltage, improper starting, over-travel or other undesirable conditions, G-E controls operate to give the utmost protection.

Your choice should be based on the work to be done and any one of the offices and warehouses of the General Electric Supply Corporation on the Pacific Coast can help you with exact specifications.

FULL-VOLTAGE MAGNETIC COMBINATION STARTER SWITCH
CR 7008

This switch is for full voltage starting of squirrel cage motors or as a primary switch for wound rotor motors.

MAGNETIC STARTER CR 7006

MANUAL STARTER CR 1061

LIMIT SWITCH LEVER TYPE CR 9440

PHOTO ELECTRIC RELAY CR 7505

PILOT CONTROL SWITCH CR 2960

PUSH BUTTON CR 2943

PRESSURE SWITCH CR 2927

FLOAT SWITCH CR 2931

MANUAL-REDUCED VOLTAGE STARTER CR 1034

ELECTRONIC TIMER CR 7504

GENERAL ELECTRIC SUPPLY CORPORATION

SAN FRANCISCO • OAKLAND • SACRAMENTO • FRESNO • LOS ANGELES
SAN DIEGO • PHOENIX • SEATTLE • PORTLAND • TACOMA • SPOKANE

Another achievement of Shell Research—

SHELL DIALA OIL 15

a revolutionary transformer oil that gives 50-year service

We went into the problem of oil oxidation

We studied how, under heavy load conditions in transformers, both heat and oxygen could change an oil chemically . . . cause sludge, acidic deterioration products and peroxides. These are the impurities which reduce cooling efficiency . . . damage cloth insulation . . . ultimately corrode exposed copper and iron surfaces. Until our study, there wasn't much you could do about it except to spend money on oil changes and transformer overhaul, or invest in expensive oil protection devices such as conservators.

Shell Diala Oil 15 was developed to step costs down

We examined Shell Diala Oil 15 against all competitive oils on the market, comparing rates of oxygen absorption at high temperatures as well as more commonly measured properties. Even our top research men were surprised when Shell Diala Oil 15 resisted oxidation *140 times longer* than the next best transformer oil. Judging by these accelerated tests, Shell Diala Oil 15 *can last better than 50 years in even an open, air-breathing transformer.* That means money saved and then some!

And that isn't all—

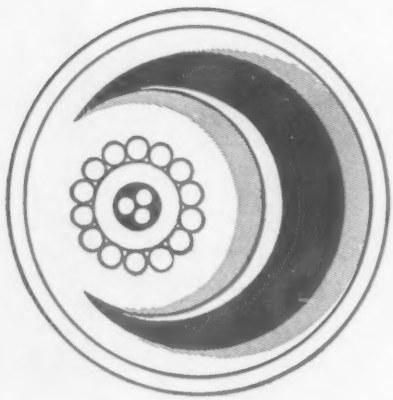
Further tests proved that Shell Diala Oil 15, in addition to its remarkable oxidation resistance, possesses all other properties required of superior transformer oil . . . excellent thermal transfer, a dielectric strength above 30,000 volts . . . a very low pour point . . . minimum volatility . . . up to 37% less fabric deterioration. And it is equally effective for oil-filled switches. Ask your Shell representative where and how it can help you.

ARE YOU ABSOLUTELY SURE YOU ARE GETTING ALL THAT'S NEW IN LUBRICATION?

Your Shell Lubrication Engineer can make a complete study and analysis of your plant and machines . . . give you engineering counsel, advice on new lubricants and their application . . . help you set up schedules and controls for each and every machine. For that kind of service — call in your Shell Lubrication Engineer.

SHELL

CRESCENT
VARNISHED CAMBRIC POWER CABLE



Heavier loads for longer periods of time are possible with CRESCENT VARNISHED CAMBRIC CABLE. This general-purpose, industrial power cable provides higher current-carrying capacity for the same size of copper conductors, together with maximum safety and permanence.

Available with weatherproof braid cover for dry locations, with a lead sheath for wet locations, or with a steel tape parkway armor construction (Type VCLJFJ) for burial in the earth without additional protection.

CRESCENT
WIRE & CABLE
CRESCENT INSULATED WIRE & CABLE CO.
TRENTON, N. J.

now

HIGH INTERRUPTING CAPACITY in a 50-ampere indicating fuse cutout

Effective
April 19, 1948
Prices Reduced
5 Percent

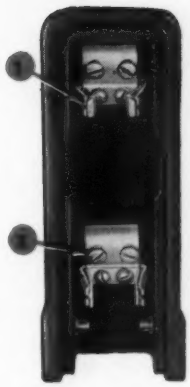
Here is a new cutout for utilities having high-capacity distribution feeders—and for all who have wanted high *interrupting capacity* in a cutout without paying for unneeded high *continuous* current rating.

* * *

This new General Electric *heavy-duty* 50-ampere indicating cutout has an interrupting rating of 5000-rms amperes at 5000 volts (or line-to-neutral of 8330 volts grounded wye) and 8000-rms amperes at 2500 volts (or line-to-neutral of 4160 or 4330 grounded wye).

Price is intermediate between the light-duty 50-ampere cutout and the medium-duty 100-ampere cutout—or roughly one-third that of the 200-ampere cutout (continuous rating) having comparable interrupting rating.

This new unit has all the features that have built the outstanding reputation for safety, reliability and ease of fusing of other G-E enclosed cutouts. For details and prices, ask for GEA-5019, *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*



Housing is of wet-process porcelain, glazed inside and out, with hanger support *cemented* into back.

1 Contact clips and terminals are silver plated, and cemented into housing. Stainless-steel springs reinforce each contact clip.

2 Clamp-type terminals have retracting clamping shoes, actuated by separate silicon-bronze large-head screws.

Door is of molded Textolite, well reinforced. Fuseholder tube is of laminated linen-base Textolite and fiber, easily replaced and with exceptional resistance to both weathering and arcs.

3 The synthetic sponge-rubber barrier, cemented to the cover barrier, forms a seal between upper and lower contacts, and prevents arc gases from causing flashover.

4 When fusible section of fuse-link melts, spring-operated indicator arm pulls cable downward and completely out of tube—assuring quick interruption even with 1-amp links.

Door hinges are so positioned that recoil forces act to hold door closed—an important factor in achieving the high interrupting rating. Door is isolated from all live parts when open.

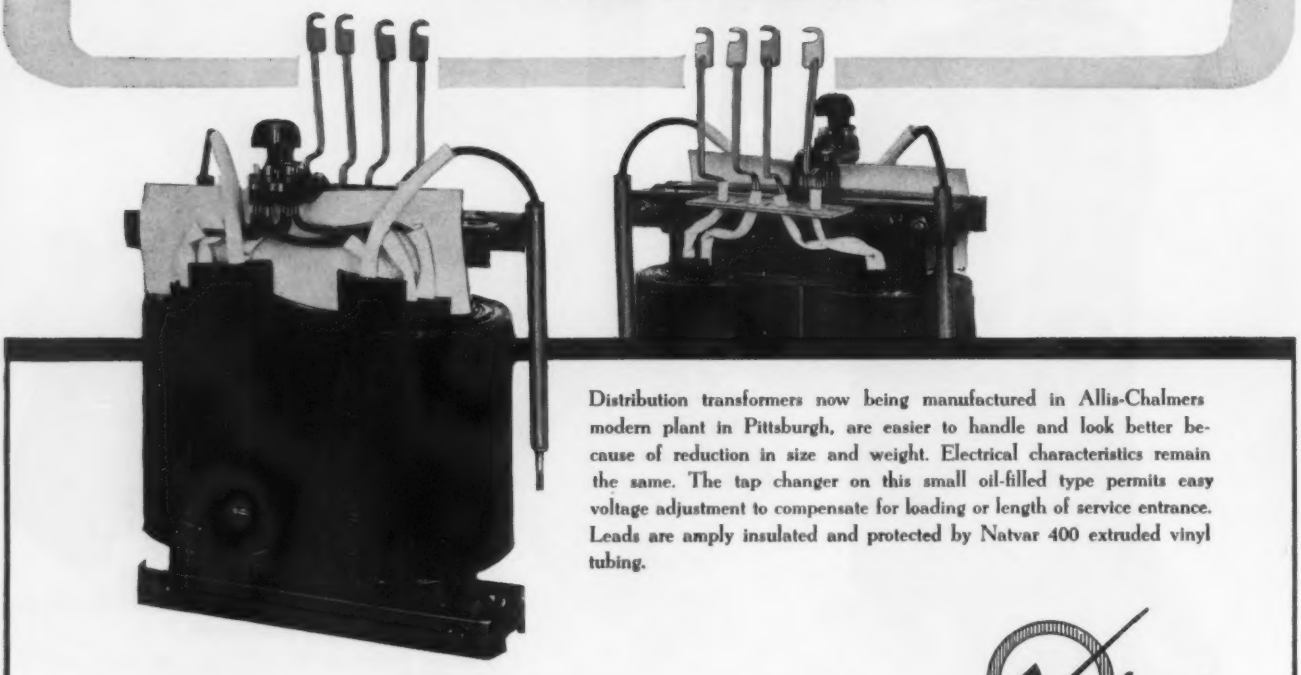
5 After cutout has operated, indicating arm projects from bottom of door as shown—clearly showing that fuse has blown.

GENERAL ELECTRIC

406-25

ALLIS-CHALMERS INSULATES AND PROTECTS TRANSFORMER LEADS

WITH **NATVAR 400**



Distribution transformers now being manufactured in Allis-Chalmers modern plant in Pittsburgh, are easier to handle and look better because of reduction in size and weight. Electrical characteristics remain the same. The tap changer on this small oil-filled type permits easy voltage adjustment to compensate for loading or length of service entrance. Leads are amply insulated and protected by Natvar 400 extruded vinyl tubing.

With capacity at an all-time high, utilities are doing an outstanding job of keeping up with the relentlessly increasing demand.

Allis-Chalmers distribution transformers, in serving widening areas and areas of increasing density, have handled loads far in excess of their rated capacity for considerable lengths of time without interruption.

Natvar 400, approved for continuous operating temperatures of 105°C., gives lasting insulation and protection to the leads because of its uniformly superior resistance both to high temperatures and to oil.

Prompt deliveries — either from the stock of a wholesaler near you — or direct from our own. Full Underwriters' report on request.

Represented by Electrical Specialty Co.

San Francisco 3	Los Angeles 13	Portland 5	Seattle 1	Denver 2
316 Eleventh St.	418 East Third St.	1215 S.W. 16th Ave.	2406 First Ave.	1015 - 21st St.

Natvar

Natvar Products

- Varnished cambric—straight cut and bias
- Varnished cable tape
- Varnished canvas
- Varnished duck
- Varnished silk
- Varnished special rayon
- Varnished Fiberglas cloth
- Silicone coated Fiberglas
- Varnished papers
- Varnished tubings and sleevings
- Varnished identification markers
- Lacquered tubings and sleevings
- Extruded vinyl tubing
- Extruded vinyl identification markers

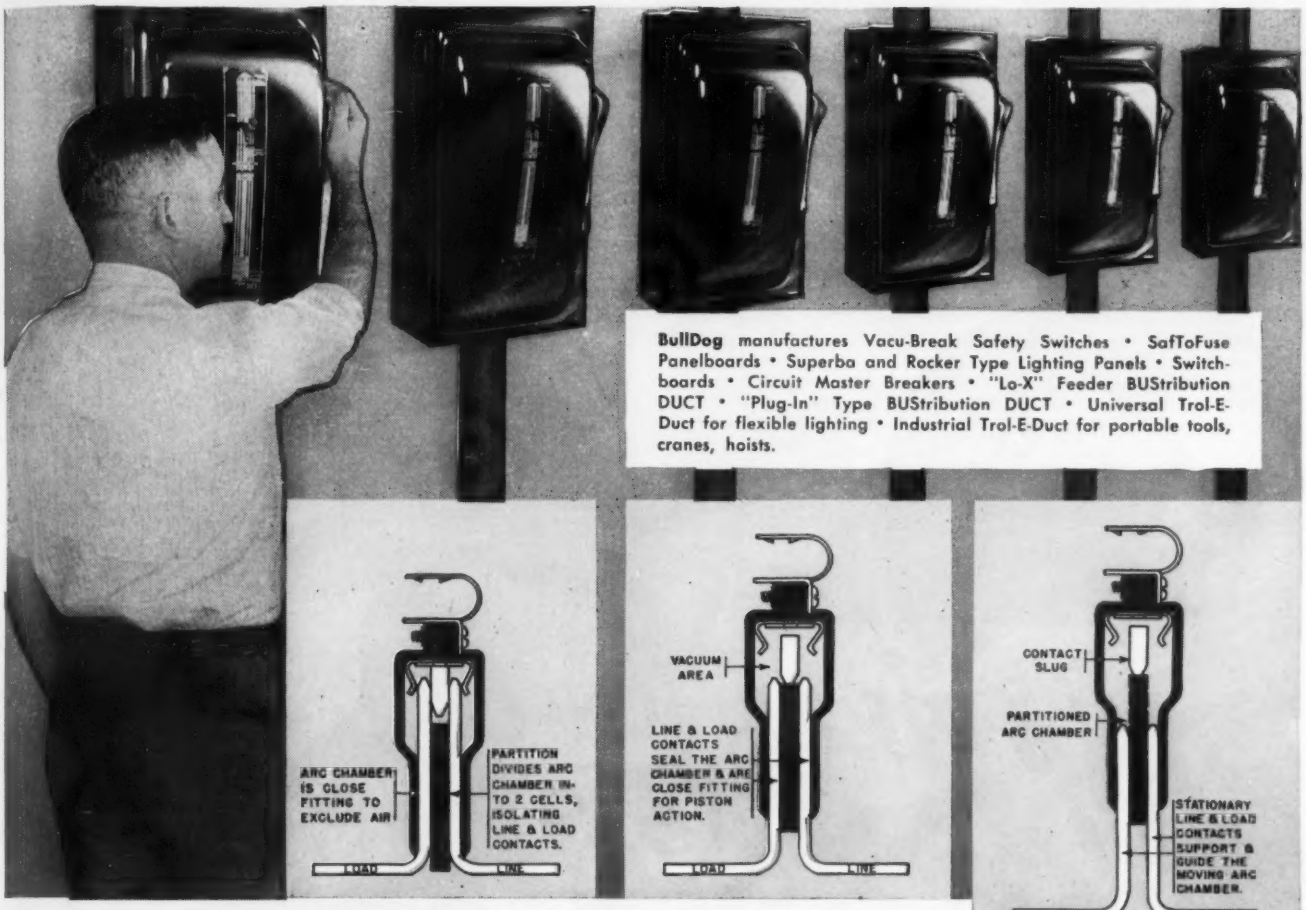
Ask for Catalog No. 21

THE NATIONAL VARNISHED PRODUCTS Corporation

TELEPHONE RAHWAY 7-2171

CABLE ADDRESS NATVAR: RAHWAY, N. J.

233 RANDOLPH AVENUE ★ WOODBRIDGE NEW JERSEY


ARC CHAMBER IS CLOSE FITTING TO EXCLUDE AIR
PARTITION DIVIDES ARC CHAMBER IN-TO 2 CELLS, ISOLATING LINE & LOAD CONTACTS.
LOAD
LINE
VACUUM AREA
LINE & LOAD CONTACTS SEAL THE ARC CHAMBER & ARE CLOSE FITTING FOR PISTON ACTION.
LOAD
LINE
CONTACT SLUG
PARTITIONED ARC CHAMBER
STATIONARY LINE & LOAD CONTACTS SUPPORT & GUIDE THE MOVING ARC CHAMBER.
LOAD
LINE

BullDog manufactures Vacu-Break Safety Switches • SafToFuse Panelboards • Superba and Rocker Type Lighting Panels • Switchboards • Circuit Master Breakers • "Lo-X" Feeder BUStribution DUCT • "Plug-In" Type BUStribution DUCT • Universal Trol-E-Duct for flexible lighting • Industrial Trol-E-Duct for portable tools, cranes, hoists.

IN FULL "ON" POSITION, the partitioned bakelite arcing chamber carries the free-floating contact slug in perfect alignment. The "Clampmatic" pressure spring assures contacts tight as a bolted connection.

RUPTURING THE CIRCUIT, the quick outward movement of the housing reduces the amount of air in the arcing chamber. Magnetic blow-out force throws the arc against the chamber walls for final dissipation.

IN FULL "OFF" POSITION, the stationary contacts remain partially inserted in the arcing chamber, sealing them against dust and dirt.

Safety switches with built-in "watchdogs"

EACH BullDog Vacu-Break Safety Switch has an automatic guardian which springs to action whenever a dangerous arc threatens.

Vacu-Break means real safety

With BullDog Vacu-Break Safety Switches, arcing cannot get out of control. When contact is broken, the limited air supply automatically snuffs out the arc in an instant. The special, exclusive construction of the arcing chamber all but eliminates arcs entirely. And the CLAMPMATIC feature assures contacts tight as a bolted connection for cool operation.

Long-lived, too

BullDog's Vacu-Break feature means greater efficiency and longer useful life, too. Burning and pitting of contact points are greatly reduced. Current flows smoothly through the silvered copper conductors.

All ways, Vacu-Break Safety Switches are better. Safer . . . dangerous arcs are curbed. More efficient . . . power flows smoothly. Longer lasting . . . wear due to burning and pitting is drastically reduced.

BullDog's Field Engineers welcome the chance to sit in on planning stages of a building project. Their knowledge of electrical distribution layout can mean savings in installation and maintenance costs, as well as highest efficiency and reliability in actual operation. Why not take advantage of this pre-building service?

BULLDOG ELECTRIC PRODUCTS COMPANY
DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES
IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO

BULLDOG

HEADQUARTERS FOR ELECTRICAL DISTRIBUTION

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Safety Switchboard Company
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Mullenbach Electrical Manufacturing Co.
2300 East 27th Street Tel. Jefferson 2224
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EASY TO APPLY

Flip-on

TAP CLAMPS

FOR QUICK AND TROUBLE-FREE CONNECTIONS TO A. C. S. R. OVER ARMOR RODS

THESE one-piece clamps have been in such short supply that you have had to accept substitutes. Now they are available from stock. These are the only clamps so easy to apply, so light in weight, so well-designed to avoid loosening because of material cold flow.

Ask your line foremen

Reliable

ELECTRIC COMPANY

3145 CARROLL AVENUE CHICAGO 12

OVER 40 YEARS Service TO THE UTILITIES

The rugged, thermo-plastic enclosure of the Bulletin 600 Switch is in harmony with the streamlined design of modern equipment.

Bulletin 600 Starting Switches are made in many types of enclosures, as illustrated on this page. Switches with pilot lights can be furnished in general purpose, pressed steel enclosures, as shown above, or in cast iron cabinets for watertight or weatherproof industrial applications.

For 3-way "HAND-OFF AUTOMATIC" control. Selector switch on left. Hand-Automatic units are also available.

Cast iron, sealed enclosures for hazardous gas.

Bulletin 600 Switch with pilot light for watertight or weatherproof installations.

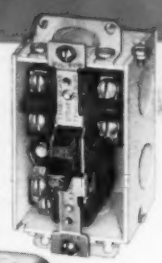
The NEW BULLETIN 600 . . . a greatly improved STARTING SWITCH for motors of one horsepower or less

Most fractional horsepower motors . . . unless equipped with built-in overcurrent protection . . . require a Bulletin 600 Switch to satisfy the National Electrical Code ruling.

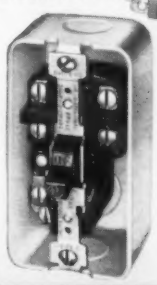
If, in addition to the automatic pilot controls, the motor circuit also has an Allen-Bradley Bulletin 600 Switch for manual control, your motor and machine are protected against sustained overloads. The self-contained thermal breaker will trip the manual switch to stop the motor . . . and the switch cannot be held closed until the overload condition is corrected.

This popular switch is made in many forms to fit every need. Write for Bulletin 600, today.

Allen-Bradley Company
1316 S. Second St. Milwaukee 4, Wis.



Bulletin 600 Starting Switch fits any standard conduit switch box.



A-B Quality

ALLEN-BRADLEY

QUALITY

STARTING SWITCHES FOR SMALL MOTORS

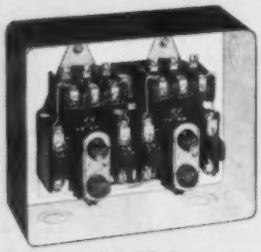
MANUAL MOTOR STARTERS

THAT MEET EVERY SERVICE REQUIREMENT

Bulletin 609 Manual Starters are available in pressed-steel and cast-iron enclosures for every industrial service.

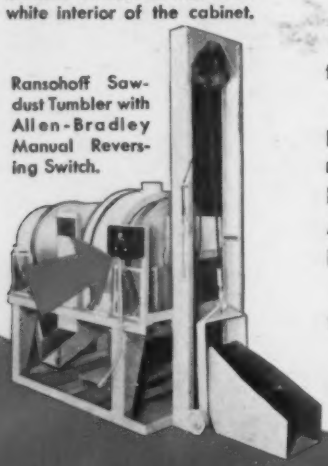
The switch is operated manually by two buttons, like a wall switch, and has two thermal overload breakers.

Gallmeyer & Livingston surface grinder with two Bulletin 609 Starters.



Bulletin 609 RS Reversing Switch with two interlocked manual switches. Note the white interior of the cabinet.

Starter on bracket for flush mounting in machine bases.



Ransohoff Sawdust Tumbler with Allen-Bradley Manual Reversing Switch.

Detroit tap reconditioning machine with flush mounted Allen-Bradley Manual Starter.

Bulletin 609 Manual Starters are preferred because they are so simple . . . so dependable . . . so trouble free.

Their quick-make, quick-break snap action is trouble proof . . . their double break, silver alloy contacts need no filing, cleaning, or dressing . . . their accurate overload breakers are reliable, even after long inaction. And there is a wide variety of enclosures to fit every kind of industrial service.

It will pay you to send for Bulletin 609 and get all the facts about these dependable, manual starters.

Allen-Bradley Company
1316 S. Second Street, Milwaukee 4, Wisconsin

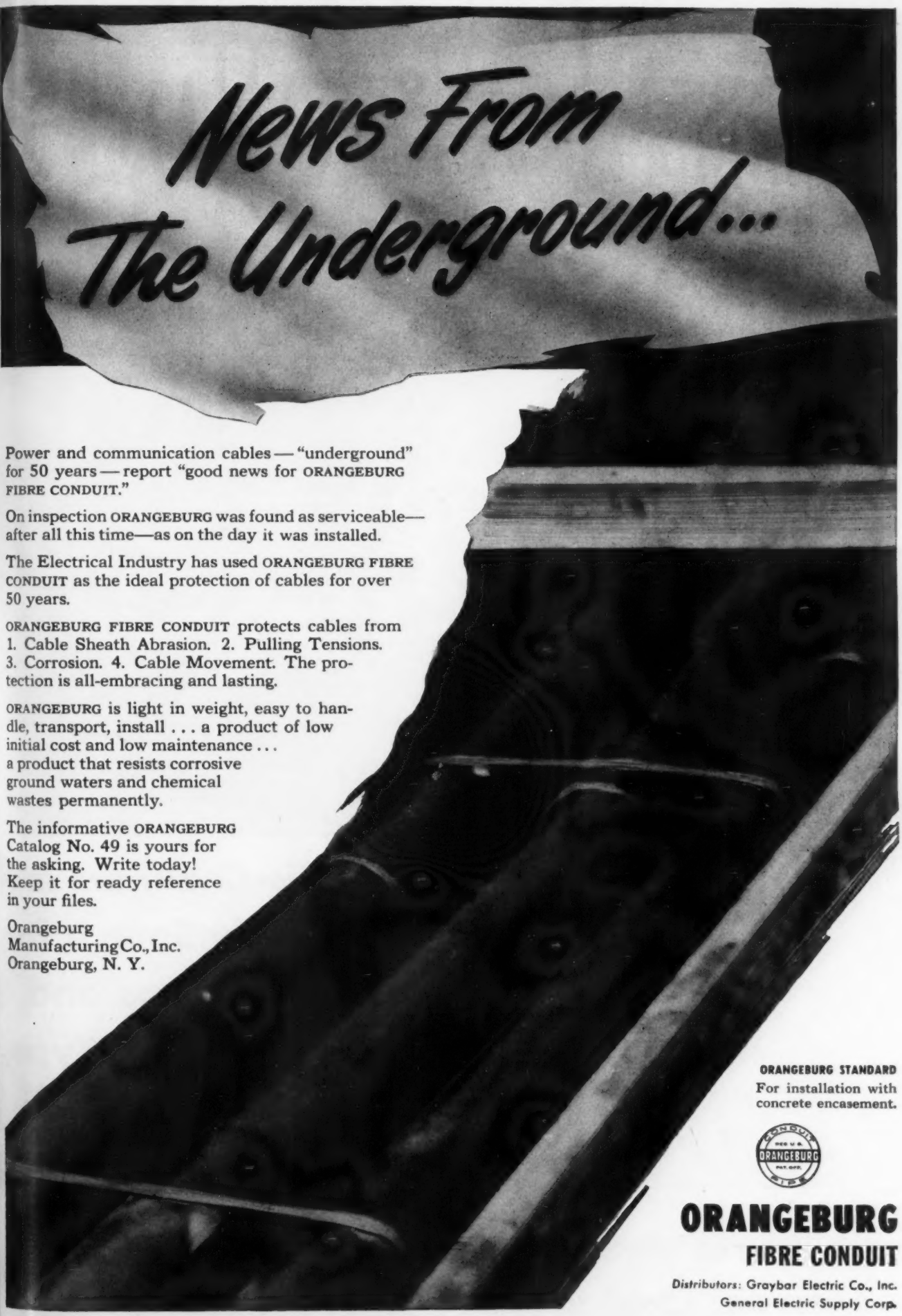
ALLEN-BRADLEY

MANUAL AND AUTOMATIC MOTOR CONTROLS

QUALITY

A-B Quality

News From The Underground...



Power and communication cables — "underground" for 50 years — report "good news for ORANGEBURG FIBRE CONDUIT."

On inspection ORANGEBURG was found as serviceable—after all this time—as on the day it was installed.

The Electrical Industry has used ORANGEBURG FIBRE CONDUIT as the ideal protection of cables for over 50 years.

ORANGEBURG FIBRE CONDUIT protects cables from 1. Cable Sheath Abrasion. 2. Pulling Tensions. 3. Corrosion. 4. Cable Movement. The protection is all-embracing and lasting.

ORANGEBURG is light in weight, easy to handle, transport, install . . . a product of low initial cost and low maintenance . . . a product that resists corrosive ground waters and chemical wastes permanently.

The informative ORANGEBURG Catalog No. 49 is yours for the asking. Write today! Keep it for ready reference in your files.

Orangeburg Manufacturing Co., Inc.
Orangeburg, N. Y.

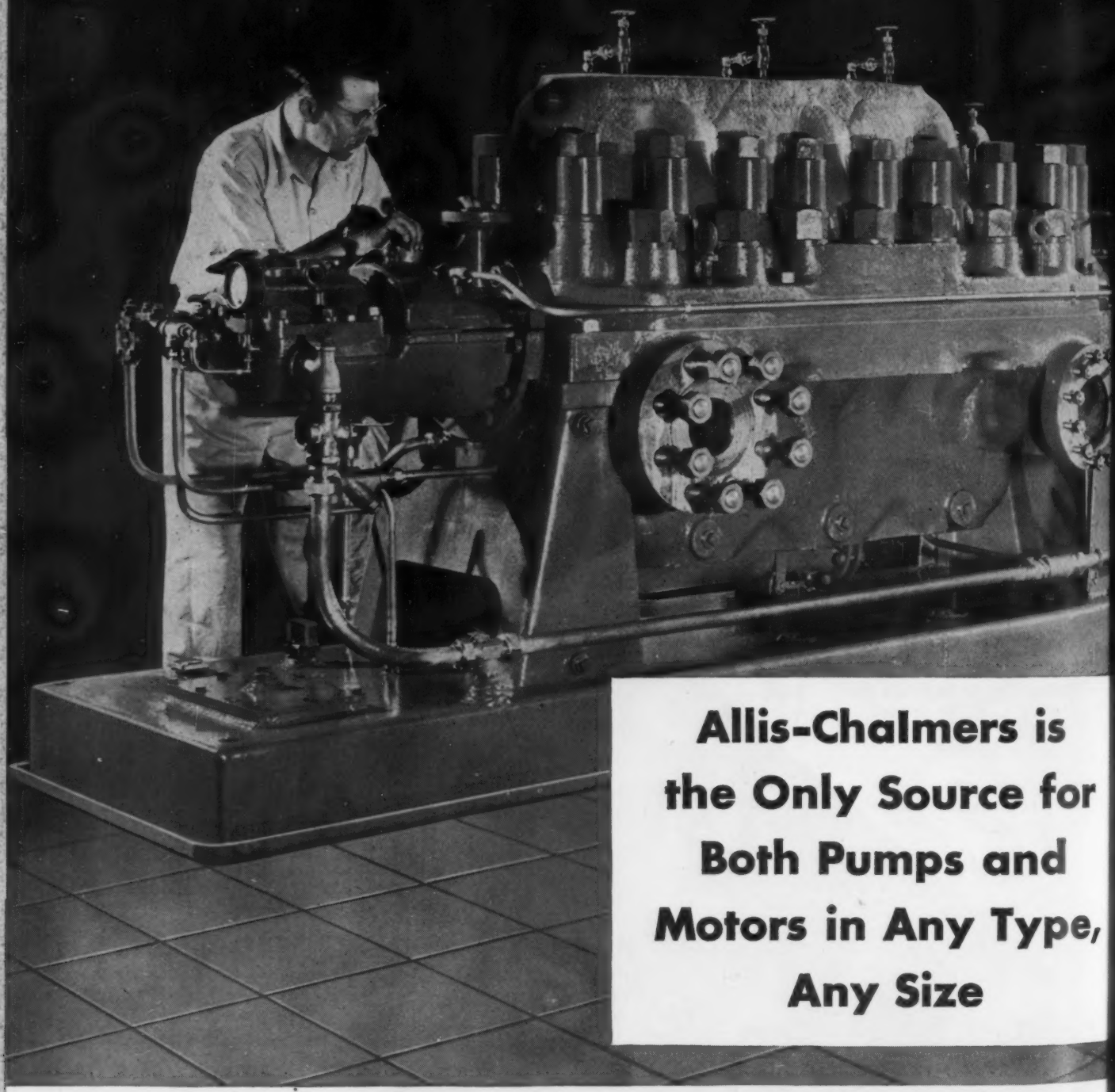
ORANGEBURG STANDARD
For installation with concrete encasement.

ORANGEBURG
FIBRE CONDUIT

Distributors: Graybar Electric Co., Inc.
General Electric Supply Corp.

Allis-Chalmers Builds for Progress i

Typical Example: POWER-HOUSE



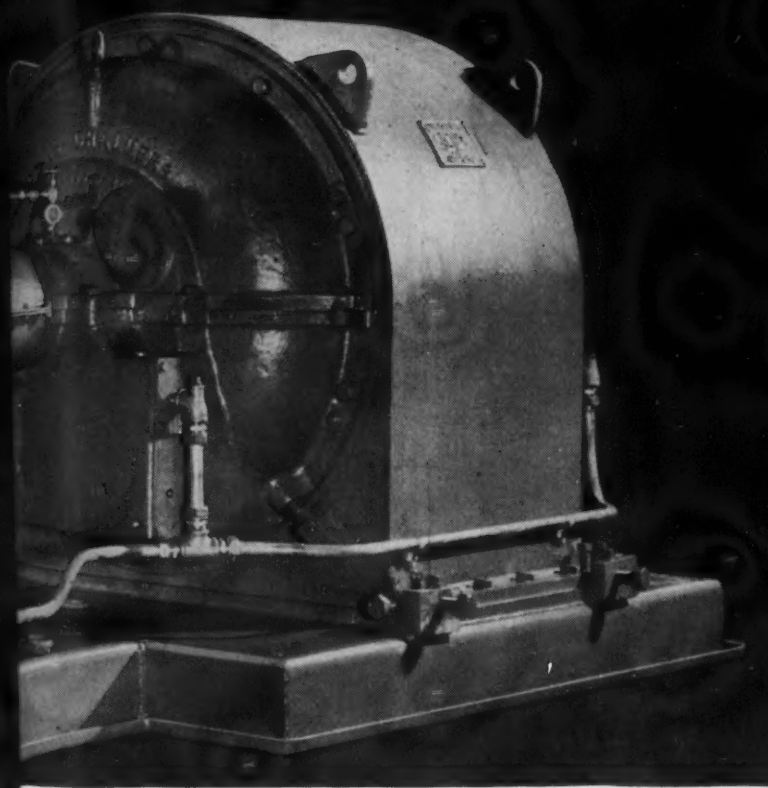
Allis-Chalmers is the Only Source for Both Pumps and Motors in Any Type, Any Size

Pioneers in Power and Electrical Equipment
From Generation Through Utilization

ALLIS-

in Electric Power—

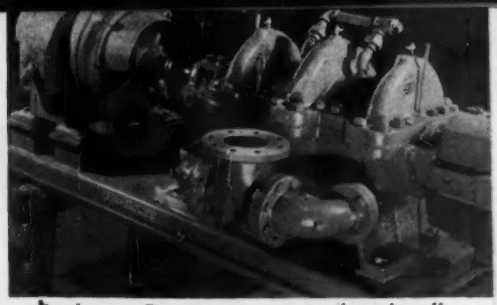
PUMPS



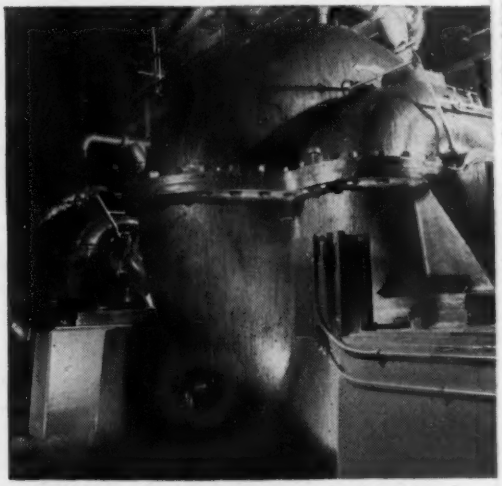
WHAT'S YOUR NEED? Is it a pump for: circulating water—condensate — boiler feed — heater drain — service water — ash removal, or any other use? Look to Allis-Chalmers!

Because A-C builds both pumps and motors, you simplify your job of ordering — and you get a carefully matched pump-motor "team." Allis-Chalmers pump designs are based on a knowledge of your needs. For example in boiler feed pumps (above), a volute casing is used. It allows smooth operation over a wide range of the head capacity curve. And the double suction impeller allows for a lower net positive suction head, (N.P.S.H.). In addition, A-C has consistently leaned toward use of the *best* materials for a given application.

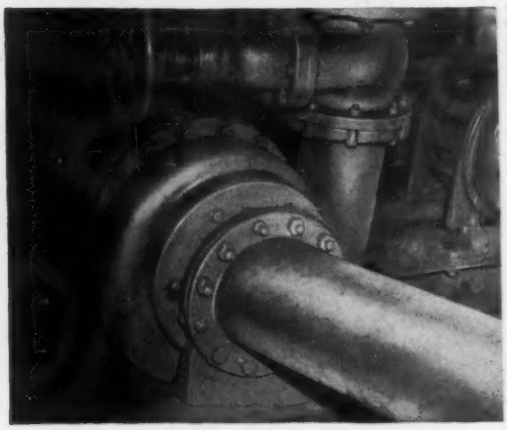
More than 60 years of pump building — 50 years of service to the electrical power industry stand behind A-C's good name in pumps and other equipment. A good name to know is ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2409



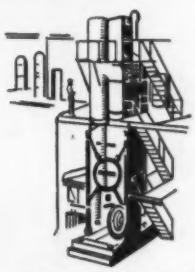
Condensate Pumps — two stage three impeller pumps with discharge pressure on sealing glands. Built in sizes to 2000 gpm.



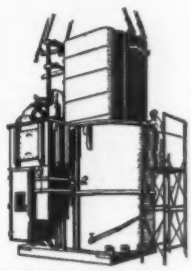
Condenser Circulating Pumps — horizontal and vertical types. Built in sizes up to 100,000 gpm.



Ash Removal Pumps — heavy duty — easily serviced pumps. Only 5 wearing parts. Sizes to 7,000 gpm.



1888 — Allis-Chalmers screw pumping engine in Milwaukee set record. After 60 years, pump is still operating.



1948—Installing an A-C power transformer with automatic voltage regulator.

-CHALMERS

ALLIS-CHALMERS A-C MILWAUKEE

Reproduced from poor material

SMOOT-HOLMAN COMPANY
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INGLEWOOD CALIFORNIA
MADE IN U.S.A.

... production geared to
WESTERN LIGHTING
REQUIREMENTS

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Smoot-Holman quality lighting equipment is western-designed and western-made exclusively for western use. Your lighting problems are quickly, efficiently and economically solved when you specify Smoot-Holman.

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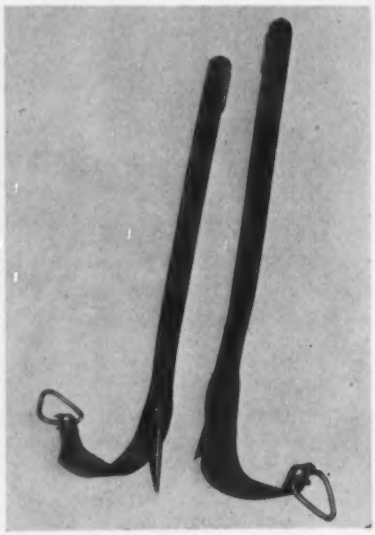
Offices in Principal Western Cities – Branch and Warehouse in San Francisco

PRODUCT NEWS

Climbers (500)

A newly designed set of matched, right and left climbers has been announced by Mathias Klein & Sons. Called the Pole Master, this set has a scientifically designed, extra-wide stirrup claimed to give greater arch support. Leg irons are constructed with taper and are flexible to eliminate chafing of ankles and calves. The shank is offset to bring gaff in proper line with leg bone. The wrought iron, triangular ring for the ankle strap gives full support to the width of the strap, thus minimizing wear. These climbers are forged from special analysis, alloy steel and weigh 2⅞ lb. per pair. They are available in stock sizes of 15, 15½, 16, 16½, 17, 17½, 18 in., and may be ordered to fit special requirements.



Jumper Sleeves (501)

A new series of Nicopress jumper sleeves and a Nicopress tool for the jumper splicing of ACSR in sizes 2/0, 3/0, 4/0 and 266,800 CM inclusive have been announced by National Telephone Supply Co. The tool accommodates all four sizes. It is toggle action, hand operated, 35 in. long, weighs lb., contains a single groove, bears the number 3-1285.

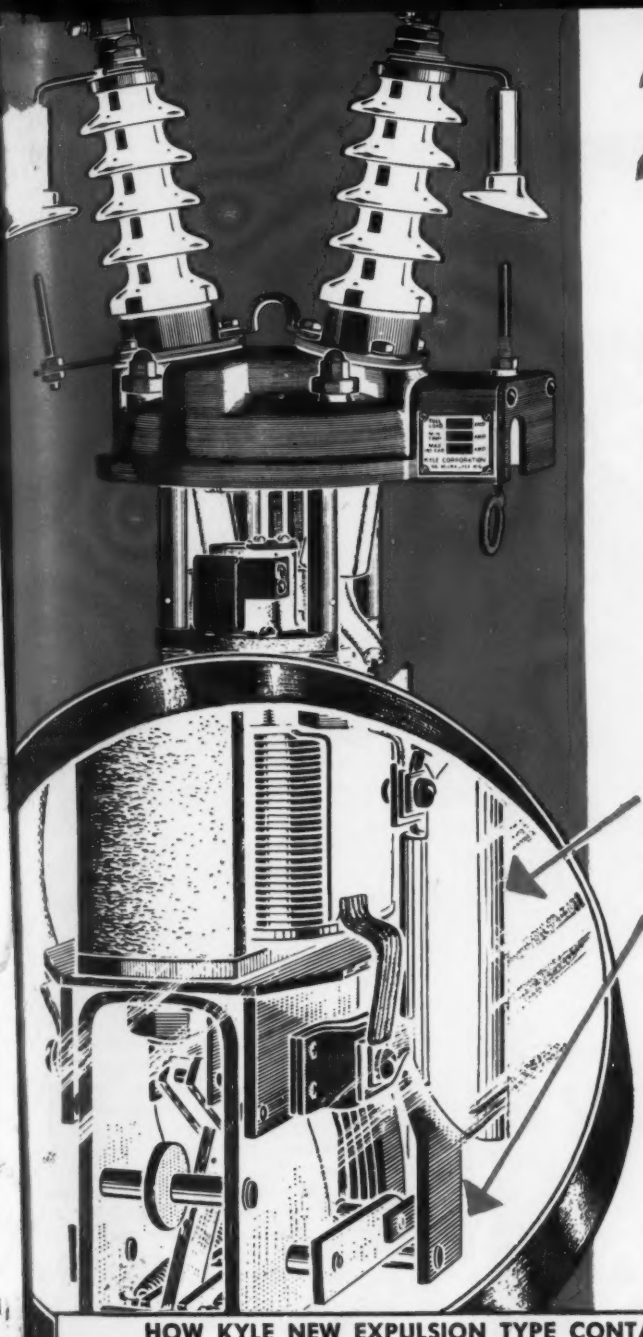
Sleeves are comparatively the same outside diameter so that only the one tool required for installation of all four s according to the manufacturer, who cl that resulting splices assure a tight b and high conductivity.

Lineman's Suit (50

Interstate Mfg. Co. has a two-piece wate proof lineman's suit made from double-te tured fabric, heat cured. It is designed to worn over regular clothing; jacket has hooded parka.

Screw Anchors (503)

Holub Sand Scott plastic expanding screw anchors are available in assortment kits in two sizes, 250 or 325 assorted anchors for wood screws No. 5 through 20 and 1/4- and 5/16-in. lag screws.



2 New KYLE Firsts Provide More Efficient Line Protection

Kyle introduced to the industry automatic oil circuit reclosers whose dual operating characteristics made possible complete coordination with fuse links. Kyle was first to provide a grounded steel tank. Kyle originated many operating and safety features which have now generally been adopted.

This Kyle leadership in the circuit recloser field comes from the fact that the entire business of our organization is the design and manufacture of automatic oil circuit reclosers. Kyle engineers, both in the plant and in the field, are experienced in every phase of automatic line protection . . . ever seeking to improve Kyle products to meet the changing needs of the electrical industry.

TODAY KYLE INTRODUCES:

More Efficient Lightning Protection New Kyle valve type coil by-pass arrester is provided to reduce possibility of lightning damage.

More Efficient Arc Interruption New Kyle Expulsion Type Contacts reduce arcing time to one cycle or less . . . reduce contact wear and oil carbonization.

All Kyle "H" Series Reclosers, both single and three phase, are provided with these new features. They are easily interchangeable on Kyle reclosers now in use.

ASK YOUR LINE MATERIAL REPRESENTATIVE

for full information on these new Kyle features. See for yourself how they can improve the automatic protection of your distribution lines.

HOW KYLE NEW EXPULSION TYPE CONTACTS INSURE EFFECTIVE INTERRUPTION OF FAULTS AT HIGH CURRENT AND WITH LOW POWER

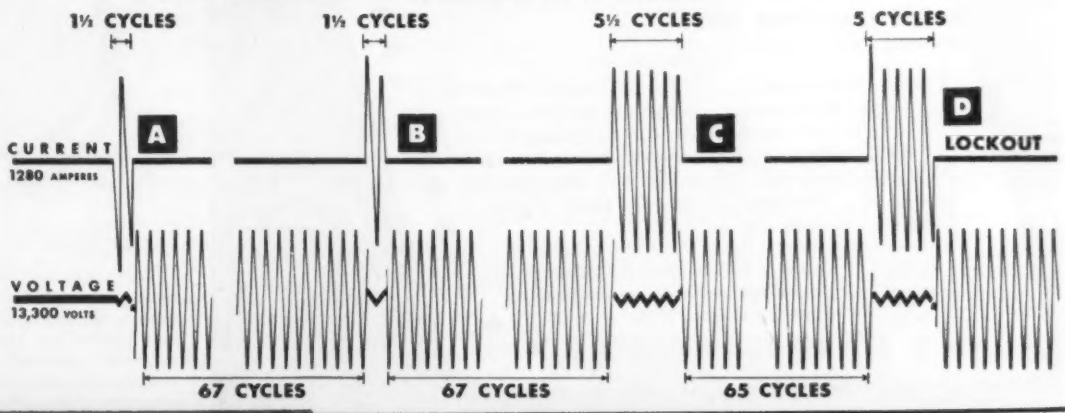
This oscillogram shows a typical example of Kyle "H" Series Recloser interruption of 1280 amperes at 13,300 volts, power factor of 23%.

A. First opening of recloser. Total clearing time, 1½ cycles. Arcing time at contacts, ½ cycle. Reclosing time, 67 cycles.

B. Second opening of recloser. Total clearing time, 1½ cycles. Arcing time at contacts, ½ cycle. Reclosing time, 67 cycles.

C. Third (time delayed) opening of Recloser. Total clearing time, 5½ cycles. Arcing time at contacts, ½ cycle. Reclosing time, 65 cycles.

D. Fourth (time delayed) opening of Recloser. Total clearing time, 5 cycles. Arcing time at contacts, ½ cycle. Recloser locks open.



KYLE COMPANY SOUTH MILWAUKEE WISCONSIN

A DIVISION OF LINE MATERIAL COMPANY MILWAUKEE WISCONSIN

USE BRIEGEL
ALL-STEEL
INDENTER-TYPE
FITTINGS!

Cross Section Showing Indentations.

Select the best, insist on Briegel All Steel Fittings, the only approved Indenter type connectors and couplings for thin wall conduit tubing. You will not only find that Briegel Indenter Fittings are easier and faster to use, but also make neater, stronger connections. Two Easy Squeezes and they're set. Start using Briegel Fittings today. Have more satisfied customers — more profits from each job.

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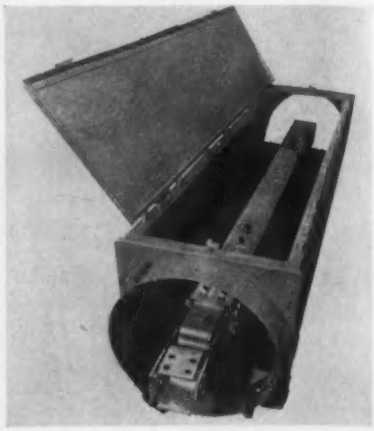
The M. B. Austin Co., Northbrook, Ill.; Clayton Mark & Co., Evanston, Ill.; Clifton Conduit Co., Jersey City, N. J.; General Electric Co., Bridgeport, Conn.; The Steelduct Co., Youngstown, Ohio; Enameled Metals, Pittsburgh, Penn.; National Enameling & Mfg. Co., Pittsburgh; Penn.; Canadian General Electric Company, Ltd.

All B-M Fittings Carry the Underwriter's Seal of Approval and Canadian Standards Ass'n Approval No. 8275.

NEATER • FASTER • STRONGER • APPROVED •

BRIEGEL METHOD TOOL CO.
GALVA, ILLINOIS

Bus Run (504)



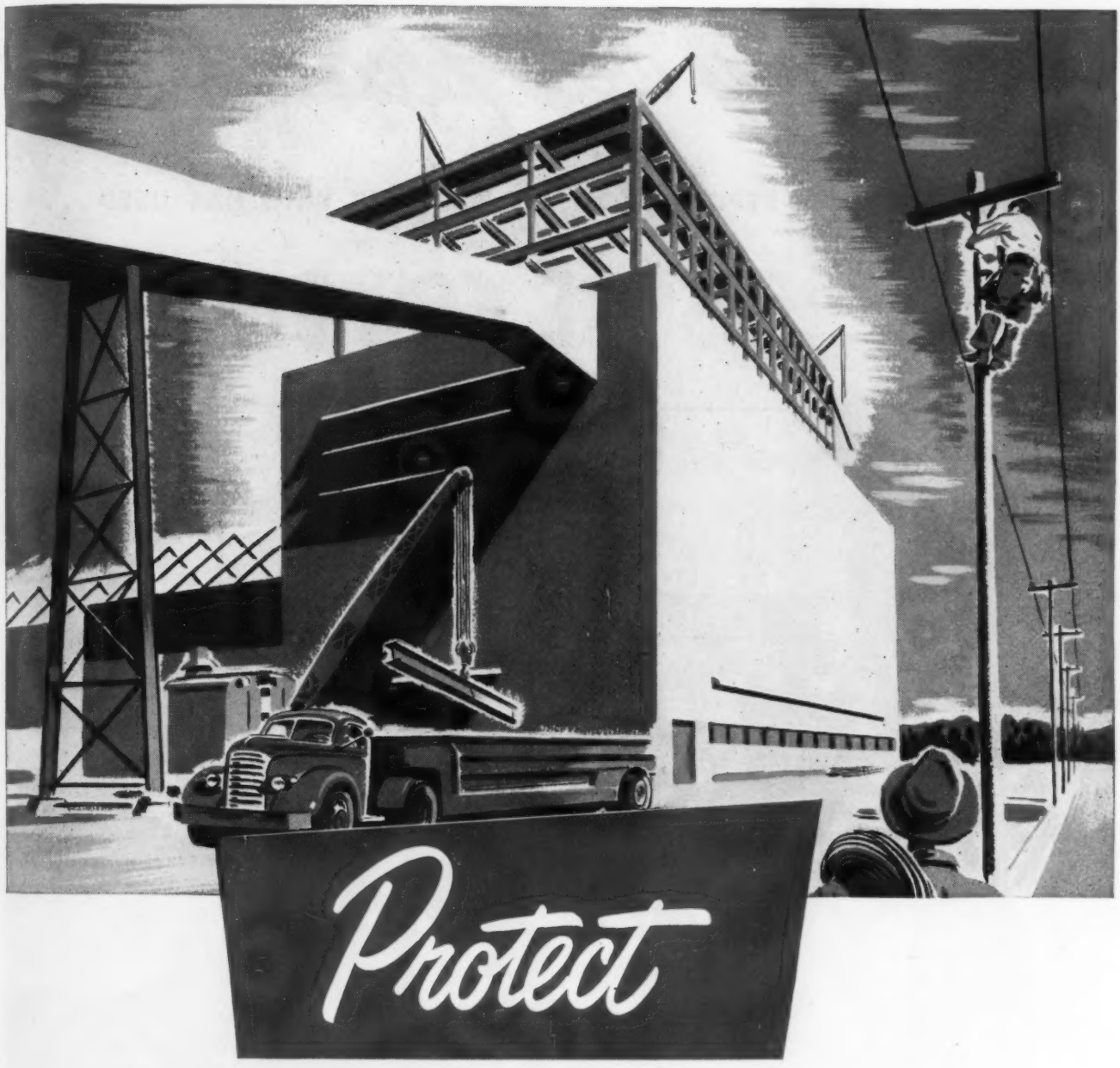
A new aluminum-enclosed isolated-phase bus run for interconnecting generators, transformers and switchgear is offered by General Electric. This equipment is available for 15-kv. applications in current ratings of 1,200, 2,000, 3,000, 4,000 and 5,000 amp. and has a basic impulse level of 110 kv. It is dust-tight and weathertight and may be used for indoor or outdoor installations; is tested and assembled to meet AIEE and NEMA standards.

Indenting Tool (505)

A lightweight portable pneumatic Hypress for indenting smaller sizes of Hylugs and Hylinks is available from Burndy Engineering Co. This tool, Polypress Y8NA, is made of aluminum alloys, weighs 1¾ lb. For safety, the jaws close with sufficient pressure to hold the connector and cable assembly in place and remain closed until opened by thumb pressure on the jaw depressor. A long hand trigger permits use of the tool in any position. Removable dies accommodate conductors from No. 8 to No. 22 AWG. Polypress delivers about 2,000 lb. indenting force from an air pressure of 80 to 100 lb. Lower pressure may be used for smaller-size connectors.

Meter Units (506)

Westinghouse has a new line of thermal ampere-demand meters built into the same case with standard watthour meters. These new meters are claimed to provide low-cost, compact units for single-phase or polyphase systems for certain types of industrial and commercial installations where kva. demands are incorporated into the rate. They are not intended for larger industrial metering, the manufacturer states. Ampere demand is measured by heating bimetallic elements with current-carrying heaters. The readings may be converted to kva. demand by multiplying by a constant assumed voltage. Five types are available.



your new Industrial Customers by using OLIVER POLE LINE MATERIALS

The new industrial plants that soon will be depending upon you for electricity, rightfully expect your line construction to be *dependable*—just as your older customers do.

When you specify *OLIVER* Pole Line Materials, you make sure that you are getting the very best that long experience and modern manufacturing methods can produce.

OLIVER
IRON AND STEEL
CORPORATION

South Tenth and Muriel Streets • Pittsburgh 3, Pa.

"Very well pleased with

GPC

A REPORT FROM AN ENGINEER WHO HAS USED . . .

GAS PRESSURE COMPENSATED

GPC "GAS PRESSURE COMPENSATED" CABLE increases current carrying capacity by keeping the internal pressure stabilized within prescribed limits. This is accomplished by the inclusion of small, perforated, gas-filled lead tubes. The heat of the loaded cable forces the cable saturant into the small holes forming hundreds of gas filled cushions which absorb any excess pressure and prevent damage to the lead sheath.

ADVANTAGES OF GPC "GAS PRESSURE COMPENSATED" CABLE

1. Insulation maintained thoroughly saturated with compound at all times.
2. Internal pressure is stabilized within prescribed limits.
3. Controlled sheath stresses. There is no repeated expansion and contraction, no fatigue or splitting of lead.
4. Pressure along cable line is uniform, not variable from joint to center of section to joint.
5. Interchangeability. Cable can be spliced to existing solid type cable without difficulty.
6. Increased current carrying capacity. Many present-day limits are based on allowable sheath stress. Type GPC Cable controls these stresses.
7. Improvement in operating voltage stress is possible, since ionization and gas inclusions are eliminated.
8. Reduced over-all transmission cost per KVA mile.
9. Continuous sheath supervision.

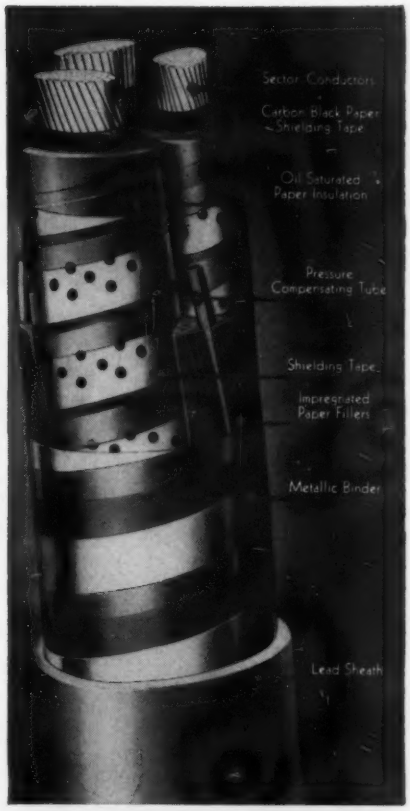
the installation"

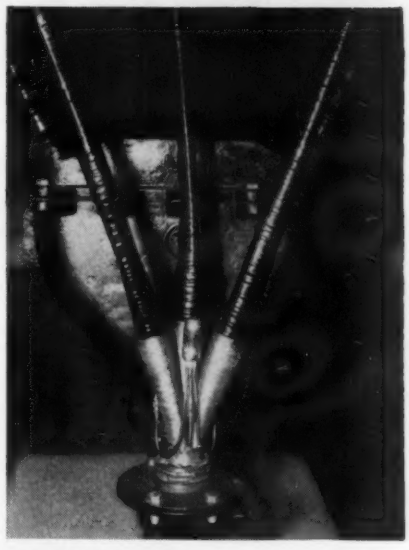
PAPER CABLE

● In the spring of 1946, a large coke plant installed four power circuits using American GPC "Gas Pressure Compensated" Paper Cable. In order to give the cable a severe test they removed one circuit from the line and carried the entire load on the three remaining circuits. The engineer's report is as follows:—

"We kept regular running records of the load, sheath temperatures, and gas pressure on the three cable circuits. The maximum sheath temperature was around 43°C with corresponding gauge readings for the gas lines running in close agreement from approximately 12½ to 13¼ lbs. All these readings seem to be very consistent with little variation while the fourth length, which though discontinued from the circuit is still on the same gas pressure lines, shows a normal gauge reading of 10 lbs. which was the original setting. There was no occasion to add nitrogen from the supply tank and the tank pressure gauge shows very little change from its original setting. There is no sign whatever of any oil leaks and the even maintenance of pressure would also indicate that no leakage had occurred."

As a result of this performance test the engineers in charge have recommended GPC "Gas Pressure Compensated" Cable for future installations.





TERMINATION of GPC Cable in a pothead. Note simple connection of pressure tubes.

AMERICAN STEEL & WIRE COMPANY
Cleveland · Chicago · New York
Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
Tennessee Coal, Iron & Railroad Company, Birmingham, *Southern Distributors*
United States Steel Export Company, New York
UNITED STATES STEEL

AMERICAN STEEL & WIRE COMPANY
USS
AMERICAN ELECTRICAL WIRE AND CABLE
UNITED STATES STEEL

U·S·S Paper Insulated Cables

KLEIN TOOL BELTS

"KLEIN-LINE" BELT
New design with "Klein Kord" Sliding Trace that allows movement of approximately 6 inches in either direction. Reduces chafing and safety strap wear. Comfortable latigo leather cushion. All sizes.

"KLEIN-KORD" BELT
Made of "Klein-Kord," the material made famous by Klein Red Center Safety Straps. Wide, comfortable fabric cushion. All sizes.

★ To the lineman a fine tool belt is more than a necessity—it is a proud possession that assures safety, comfort and convenience—is essential to efficient work.

Klein Tool Belts—favorites among linemen—are made in a range of styles and sizes to suit individual preferences and requirements. Advantages of Klein Belts include tested "Dee" rings drop forged from the finest steel . . . hand-set rivets of solid copper . . . lock stitched sewing with hot waxed thread . . . convenient tool loops . . . plier pocket, tape thong and knife snap.

Illustrated here are two recent additions to the complete line of quality Klein Tool Belts—the "KLEIN-LINE" Belt with the sliding trace and the "KLEIN-KORD" Belt made of multiple plies of long staple cotton vulcanized in rubber.

To assure the last word in comfort, convenience and safety be sure to specify Klein Tool Belts.

Ask Your Supplier
Foreign Distributor: International Standard Electric Corp., New York

A copy of the Klein Pocket Tool Guide, showing the Klein line and containing valuable tool information, will be sent on request.

KLEIN TOOLS EST. 1857 TRADE MARK REG.

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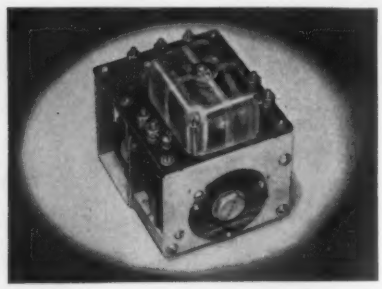
Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.
3300 BELMONT AVENUE CHICAGO 18 ILLINOIS

Time Delay Relay (507)

Ward Leonard is making Bulletin 362 motor-driven time delay relay with composite connections. This a-c timing relay is designed for use in processing, machine tool, signal, sound and other control equipment or for systems where an adjustable time delay, after closing the pilot circuit, is required for proper remote, automatic or sequential operation.

Essentially, this relay consists of a small synchronous motor, a differential gear system, built-in brake assembly, trip switch assembly, an accessible terminal board and auxiliary relay. It is equipped with a safety locking device.

By properly connecting external connection jumpers to the relay terminal board, two different timing sequences may be obtained. With one set of connections "delayed make" with a maintained pilot circuit is provided. The other set of connections permits "instantaneous make" and "delayed break" with a momentary contact pilot circuit.



Foot Switch (508)

Square D is making a heavy-duty oil-tight foot switch, as an addition to its line of machine tool control accessories. Self-contained contact mechanisms are easily wired and replaced, according to the announcement. Snap action contacts are rated 600 volts pilot duty, a-c or d-c. Contact arrangements are SPDT, DPDT, and two stage (each stage being SPDT). Single-pole switches have one, and two-pole switches have two self-contained SPDT units which may be removed and replaced by use of a screwdriver. Contact operation is snap action.

Time Switch (509)

Design changes in its Badger 50-amp. time switch have been announced by Reliance Automatic Lighting Co. Switches now in production feature a redesigned cabinet, with six combination ¾- and 1-in. knockouts. Simplified wiring diagrams and solderless terminals are said to facilitate installation. Depth of cabinet has been reduced to bring the face plate of the mechanism flush with the edges of the case. Space for projecting dial and mechanism parts is provided in a one-piece drawn steel cover.

Pin-Type Insulator (510)

A new Pinco No. 1044 pin-type insulator has been designed by the Porcelain Insulator Corp. The new design features a tie wire groove with a radius of ½ in. and is applicable to installations calling for conductor up to and including 3/0 ACSR with rods, the manufacturer states. Specifications include: dry flashover, 75 kv.; wet flashover, 45 kv.; leakage distance, 8 in.; dry arcing distance, 4¾ in.; wet arcing distance, 2 in.; mechanical strength, 3,000 lb.

ALUMINUM! lighter, easier to handle!

Pulling through conduit, handling and stringing are easier with insulated wire and cable made with Alcoa E.C.* Aluminum Conductor. A 500,000 cm. insulated aluminum cable, for example, is less than half the weight of an identical copper cable.

You see the savings of aluminum wire even before it's installed. Cable costs are lower. Shipping and handling costs are less. Those savings add up to far lower cost installation.

You'll meet no problems of conductivity—of conduit layout—of joints and terminals. Use aluminum just as you've always used wire and cable.

Alcoa supplies light, strong, conductive E.C. Aluminum to leading wire manufacturers. They draw, strand, insulate, and sell it under their own trade marks. You can see for yourself how much you'll save on the next job when you *figure it in aluminum*. ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh 19, Penna.

*E.C.: *Electrical Conductor* Aluminum

NO PROBLEMS of conductivity NO PROBLEMS of joints and terminals NO PROBLEMS of conduit layout AND YOUR SUPPLIER HAS IT!

Insulated and sold by leading wire manufacturers

ALCOA EC ALUMINUM

FOR ELECTRIC WIRE AND CABLE

R&S
FLOOR
BOXES
and ACCESSORIES
UNIQUE FEATURES
MODERN DESIGN
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COMPACT..CONVENIENT
A complete line of sturdy Watertight Floor Boxes, single or gang types; Combination Floor Extension Sets, Floor Outlet Type Receptacles, Heavy Duty Floor Receptacles & Plugs.
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Order No. 124 Assortments direct from Cleveland. Price—$43.50, subject to distributor discounts.
ONE OF MANY Superior Brush ASSORTMENTS AVAILABLE FOR YOUR CONVENIENCE...
Our No. 124 Assortment is a wonderfully handy selection of exactly 124 representative Superior Carbon Brushes for fractional horsepower motors—Century, Delco, Wagner, Westinghouse—practically all popular makes. Every brush embodies Superior quality (28 years' background) at its best.
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SUPERIOR CARBON PRODUCTS, INC.
9121 GEORGE AVENUE • CLEVELAND 5, OHIO
"Since 1919"
SUPERIOR CARBON BRUSHES

Motor Control (511)

Control of any number of motors rated up to 200 hp. at 440 volts is made possible by a motor control center announced by General Electric. These centers are designed to permit all connections to be made from the front, permitting centers to be lined up against the wall or in back-to-back fashion. They consist of standard starter units which are slid into vertical cabinet-type sections in building block fashion. The sections are 90 in. high, 20 in. wide and 12 in. deep.

Starters are furnished in five different sizes and each is a complete, fully enclosed unit which may be arranged within the vertical sections to suit the requirements of the user.

Power connections to the starters are made by "clothespin" contacts which grasp vertical fuses in the rear of the sections when the starters are slid into place. Control inter-connections to other motors and control are made through a special wiring trough, with a removable cover, which runs the length of the section.

Each starter has a built-in circuit breaker for short-circuit protection. These breakers are interlocked so that the doors of the section cannot be opened when the power is on.

Potentiometer (512)

A portable potentiometer for precise measurements of very low voltages has been announced by G-E. This device is for checking temperature-measurement instruments and for testing rotating machines, ovens, furnaces, oil burners, steam-driven equipment and air-conditioning units. It was designed originally for measuring the low voltages of thermocouple outputs in testing G-E steam turbines.

Equipment, contained in a fabric-covered luggage case, includes the galvanometer, standard cell, working batteries and rheostats for adjusting the current through the potentiometer circuit. The potentiometer has two ranges, 0-60 and 0-6 millivolts, either of which may be selected by means of a switch on the panel. The voltage to be measured is read on two dials, with each step on the first dial being 0.2 millivolt and each division on the second dial, 0.001 millivolt.

Panel Instruments (513)

G-E has a new line of 3½-in. panel instruments of internal-pivot design, suitable for use in radio, power supplies, transmitters, amplifiers and aircraft. Designated as Type DO-71, these instruments were designed for better readability. Arc lines and distracting printing have been eliminated from the scale and a lance-type pointer and large, clear numerals have been used, the manufacturer states.

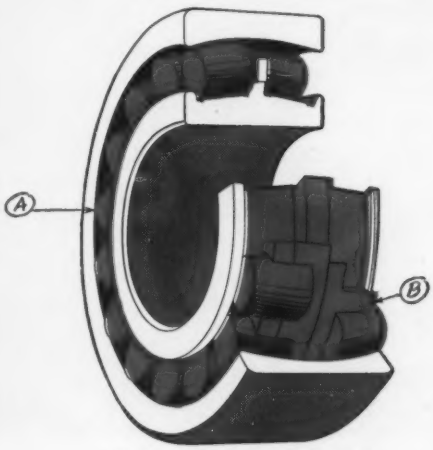
Reflector Lamps (514)

Two new 75-watt, hermetically sealed, internal reflector lamps have been developed by Westinghouse—a reflector flood and a reflector spot. The mushroom shaped R-30 bulb lamp, which supplements the R-40 150- and 300-watt bulb reflector flood and spot lamps, is 5 3/16 in. long, with 3 3/4 in. nominal diameter.

Disconnect Switch (515)

S&C Electric Co. has announced a new design of its porcelain-enclosed disconnect switch designated as ES, for application on distribution systems up to 7,500 volts and having current ratings of 200 to 600 amp.

CASE 1050--PROVIDING FLUID LUBRICATION IN ANTI-FRICTION BEARINGS WITHOUT LEAKAGE.



HEAVY-DUTY ROLLER BEARING

Heavy-duty industrial roller bearings started easier and ran freer when lubricated with Calol Grease BRB-340. Specially-made for all anti-friction bearings. Apply with grease gun or by packing.

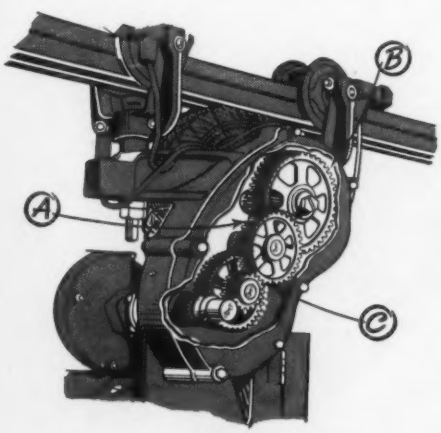
Has unusual ability - softens around roller and balls in bearings to oil-like viscosity but remains firm on outer parts. Resets quickly so oil swept aside by moving bearing parts keeps outer grease seal intact.

A. Soft consistency around moving parts of bearings lowers starting torque, reduces internal friction.

B. Firm grease forms seal that helps prevent leakage.

High resistance to deterioration under high speed conditions and extreme temperatures provides exceptional lubrication over extended periods of operation.

CASE 1062 -- MAINTAINING LUBE FILM ON HEAVY-DUTY GEARS.



HOIST GEAR UNIT FOR OVERHEAD CRANE

Viscous and tacky Calol Vistac Oils stuck tight under extreme pressures on hoist gears. Efficient for all heavy-duty gears, like industrial reduction sets. Come in six grades, 9X (SAE 10) to 45X (SAE 40). Apply by forced-feed or gravity lubricators, bottle- or wick-oilers.

A. Contain oiliness and extreme-pressure compounds. Tough film won't rupture, even on slow-moving gears with extreme pressures on wide area for long time.

B. Economical - little required to provide adequate lubrication and dissipate heat. Resist highest operating temperatures.

C. High affinity for metal maintains lubricating film, reduces power loss and wear.

Calol Vistac Oils also recommended for lubrication of air hammers, rock drills and other air-powered tools ... atomize quickly and stay fluid at low temperatures.

Trademarks, "Calol," "RPM," Reg. U. S. Pat. Off.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert service—make your maintenance job easier. Call your local Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

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FOR EVERY NEED A **STANDARD OF CALIFORNIA** JOB-PROVED PRODUCT

The UNITS in Westinghouse
Removable Breaker Unit
Primary Disconnecting Contacts
Meters
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Instruments
Relays
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Control Switches

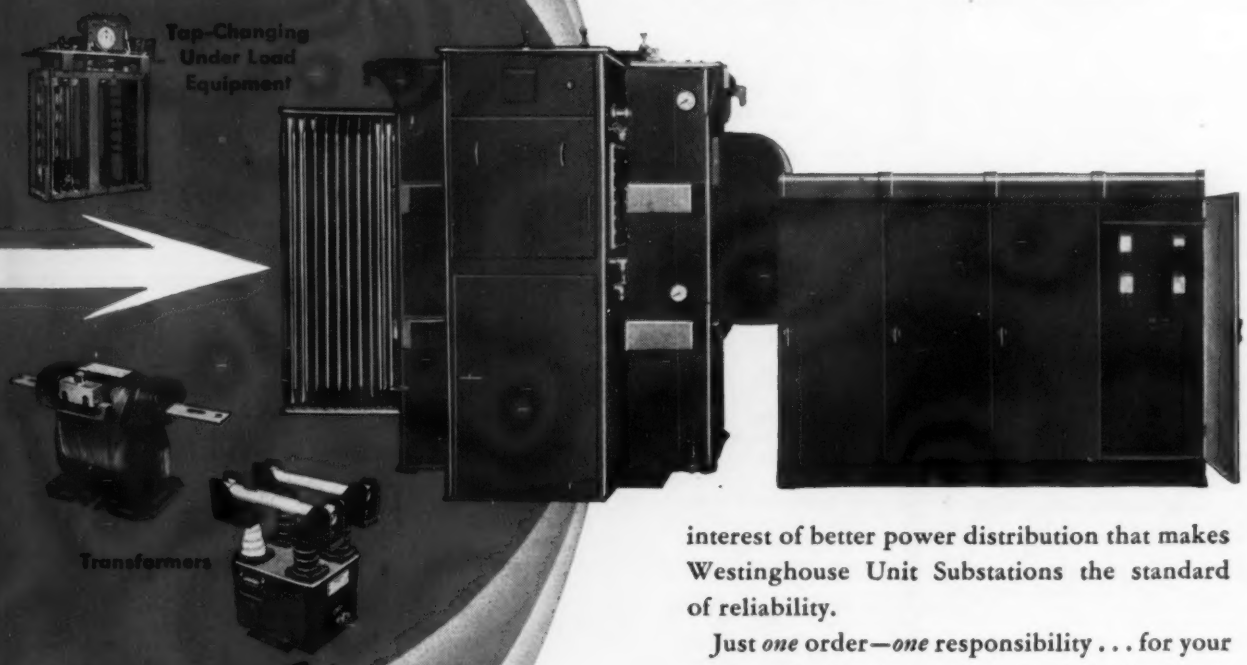
UNIT SUBSTATIONS...

...TEAMED TO PRODUCE COMPLETE CORRELATED EQUIPMENT

...Undivided Responsibility for Complete Reliability...

Modern Unit Substations must be inherently reliable, compact, flexible, easy to maintain and pleasing in appearance. Such a unit can best be built by one manufacturer designing, building and co-ordinating *all* component parts.

Westinghouse assumes this undivided responsibility of designing and building *every* part of a Unit Substation . . . power transformer, tap changing under load equipment, lightning protective equipment, circuit breakers, relays and meters. It is this specialization—undivided responsibility—and continued research in the interest of better power distribution that makes Westinghouse Unit Substations the standard of reliability.



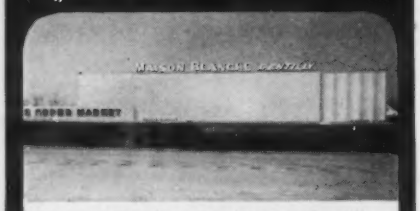
Just *one* order—*one* responsibility . . . for your power distribution equipment. Westinghouse engineers are ready to help you on any problem. Call your nearest Westinghouse office or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-97130

ADD UP THESE *Advantages*
YOUR ANSWERS TO BETTER DISTRIBUTION PLANNING

1. **Lower Maintenance Cost**... upkeep time and costs are reduced as compared to the open, structural-type substation.
2. **Modern** . . . pleasing appearance.
3. **Compact** . . . saves space.
4. **Minimum Installation Time and Cost.**
5. **Improved Service Continuity.**
6. **Undivided Responsibility** . . . complete electrical and mechanical co-ordination.

Westinghouse
PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE
UNIT SUBSTATIONS FOR ANY SYSTEM

"WIRE-NUTS" are a
Dependable
Work Saver
Says
Busy Contractor



Community Shopping Center, Gentilly, New Orleans. "Wire-Nuts" used throughout the entire Center.

Weisfeld & Son
Electrical Contracting Engineers
New Orleans, La.
August Perez, Architect
New Orleans, La.

SCREWS on Like a Nut on a Bolt

Writes William Weisfeld, of Weisfeld & Son, electrical contracting engineers, New Orleans:

"We believe that the simplest, most economical manner of making electrical wire connections is that provided by Ideal 'Wire-Nuts.'

"The operation consists only of turning a Wire-Nut on to the wires. This makes a permanent wire joint that is neat, well insulated, compact and dependable. The simplicity of Wire-Nuts makes it unnecessary to carry around special tools and extra material."

•

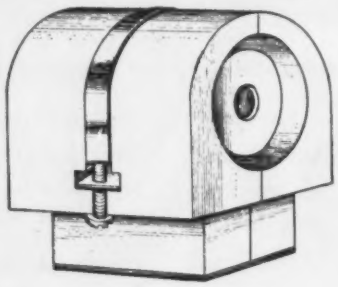
Yes, Ideal "Wire-Nuts" are the quicker, easier, safer way to make wire connections that are better electrically, stronger mechanically. Takes just a few seconds to make a permanent connection that won't pull loose or shake loose—that is heat and corrosion resistant. Requires no solder . . . no tape . . . no tools! In sizes for all usual wire combinations from two No. 18 up to and including three No. 10 solid or stranded. IDEAL INDUSTRIES, Inc., Sycamore, Ill.

Wire-Nuts®
(THE SOLDERLESS, TAPELESS WIRE CONNECTORS)
Patented — No. 1,933,555

IDEAL
Distributed Through
AMERICA'S LEADING WHOLESALERS

Lampholders (516)

Kulka Electric Mfg. Co. has a line of general-purpose lampholders for lamps using a variable range of wattages and current values from 100 to 300 ma. These lampholders will take all sizes of slimline lamps, but have the same mounting space in the fixture, according to the manufacturer. They are used in pairs, one holder for the secondary, or high-voltage end, the other for the primary, or low-voltage, end. For safety, each unit has a separate circuit, and construction permits insertion of only one end of lamp at a time. Insertion and removal is on the push-pull principle.

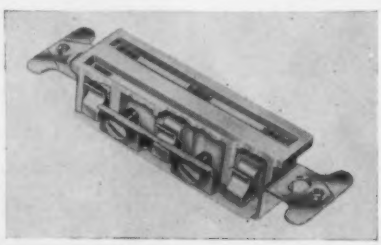


Light Meter (517)

A portable projection light meter which flashes light measurements on a screen for easy reading by large audiences has been announced by G-E. Designed primarily to simplify the problem of distinguishing between adequate and inadequate lighting, this new Model 8PH12 weighs 8 lb. It consists of three major parts, a small, hand-size light-cell probe; a D'Arsonval-type, self-contained microammeter; a standard SVE 100-watt 2x2-in. slide projector. Normal range is 0-100 ft.-candles; for higher intensities, multiplying masks are fitted over light cell.

Receptacle (518)

The Sierra Triplex, a three-outlet receptacle for installation in standard boxes, is being manufactured by the McDonald Mfg. Co. These receptacles have double contacts of heavy-duty bronze and are side wired. Head screws will take No. 10 wire and a wide space between screws is provided for easy installation. Underwriters' approved.



Luminaire (519)

Leader is offering Model VL 420 home unit luminaire, with hinged louver which drops down for tube replacement. Destaticized plastic, claimed not to warp or discolor, is used for side panels and louvers. End caps are polished chrome; reflecting surfaces are baked white enamel.

Lamp Attachment (520)

Polarized Illumination Inc. is offering a radial polarizer attachment for fluorescent desk lamps. It measures 19x4¾ in.

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INCORPORATED

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Identification Markers

Follow the latest basic rules of the American Standard "Markings for Electrical Apparatus," sponsored by NEMA and approved by American Standards Association.

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Only two simple steps required: 1. Peel off label. 2. Wrap around wire.

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Can be furnished in any size, shape or color and in any special numeral, letter, design, symbol or printing to fit your application. Stocked in 15 solid NEMA colors.

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DENVER, 1015 Twenty-first St.

TRIPLE-PURPOSE OKONITE-ENGINEERED CABLE

• Power, as well as carrier current control and communication between this crib in Lake Okeechobee and treatment plant are supplied by an Okolite cable (shown below).

Unique power feeder also furnishes operational control and communication

Though Lake Okeechobee in Florida provided the millions of gallons of water needed in its operations, the U. S. Sugar Corporation had to build a treatment plant to purify the water. Nearly 7 miles, however, separated the plant from the water-bound intake crib in the lake.

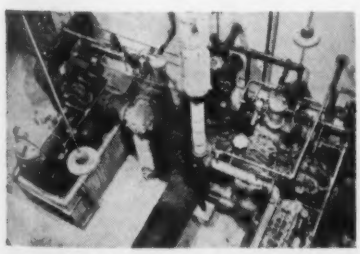
Power for the pumps and equipment was to be supplied by a three-conductor 5000-volt submarine cable originating at the treatment plant. It was also necessary to use remote control for operating the well-house machinery.

Okonite engineers were consulted and their studies showed that by proper design it was possible to combine a three-fold function in one cable. This was accomplished through the use of Okolite high-voltage insulation whose electrical characteristics permitted carrier current to be superimposed on the power conductors.

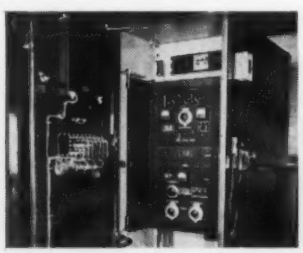
Result: An Okolite-insulated cable — armored with steel wire for the 4½-mile submarine section and with a non-metallic sheath for the 2½-mile buried section on shore — now supplies not only power and operational control but also carries a communication circuit whose talking qualities equal that of a regular telephone line.

"Unusual" cable installations have a way of turning out to be Okonite. Problem solving is our business. Why not talk over your cable problem with an Okonite engineer? The Okonite Company, Passaic, New Jersey.

5034



• Controls for well-house equipment are operated by carrier current over same conductors that supply power to pumps.

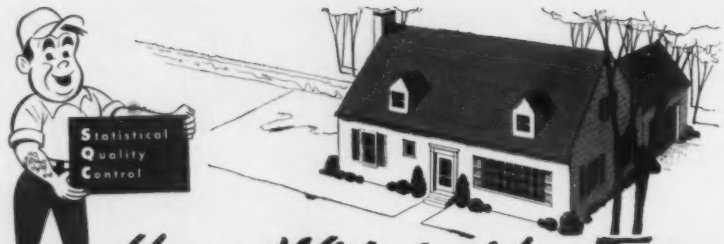


• This carrier current phone transmits voice over 7 miles from plant to well-house over the three-phase power cable.

• End view of barge and rig ready to lay submarine section of triple-purpose Okolite power cable described above.

OKONITE insulated wires and cables

THE BEST CABLE IS YOUR BEST POLICY

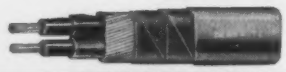


Here's Wiring with a Future

Yes, a long future that's full of satisfaction to the home owner. For the home wired today with Paranite Building Wire — Paraflex — ABC Cable—Service Cable—will be giving the same efficient electrical service in 1998 and beyond. Every bit of Paranite wire or cable is made under the watchful eye of SQC—Statistical Quality Control! Nothing is left to chance. With Paranite's goal set high and Statistical Quality Control guarding each operation, you can confidently recommend and use Paranite Wires and Cables in all residential construction.

Building Wire
Types R—RH—RW—T—TW

Service Entrance Cable



Paraflex Non-Metallic Sheathed Cable

IF IT'S **PARANITE** IT'S RIGHT!

A. B. C. Flexible Metallic Cable

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Division of ESSEX WIRE CORPORATION
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WAREHOUSES* AND SALES OFFICES: *Atlanta, Ga.; *Chicago, Ill.; Cleveland, Ohio; Dallas, Texas; *Detroit, Mich.; *Kansas City, Mo.; *Los Angeles, Calif.; *Newark, N. J.; Philadelphia, Pa.; *St. Louis, Mo.; *San Francisco, Calif.

"But you can't buy that kind of a motor..."

F—148

How many times have you heard somebody that ought to know better say something like that about motors, pumps, compressors or what-have-you? And how many times you heard somebody else say, "Oh yes you can! I saw just what we need in Blank Company's ad yesterday."

Advertising pages in this magazine are packed with *news* about your business. They contain information about products and services designed to help *you* do your job quicker, better and cheaper.

To be well-informed about the latest developments in *your* business, *your* industry . . . and to stay well-informed . . . *read all the ads too.*

McGRAW-HILL PUBLICATIONS

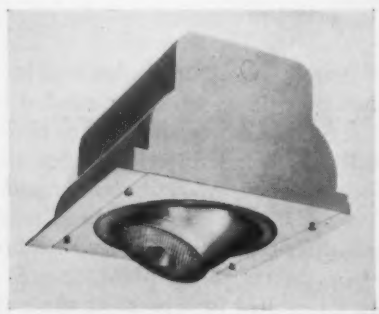
Pilot Light (521)

Square D has a new type oil-tight pilot light for machine tool applications where cutting oils and coolants may cause a general-purpose type pilot lamp to become inoperative. It is for panel mounting through a hole 1 7/32 in. in diameter. Construction permits mounting on panels as thin as 1/16 in. or as thick as 1/4 in. Color caps are available in clear, white, red, amber, green or blue and are designed for wide-angle visibility.

The a-c version of the light has a built-in transformer permitting use of a 6-volt, incandescent lamp with a miniature, bayonet-type base. The d-c version employs a 110-volt candelabra screw-base neon lamp. Series resistors are used for voltages exceeding 110 volts.

Spotlight (522)

An improved incandescent spotlight, the Trofferspot, for use with recessed fluorescent troffers has been developed by Leader Electric. The downward beam of light can be adjusted to swing in a complete circle and can be angled up to 23° from its vertical axis. A Type PAR 38/50-watt incandescent lamp of Pyrex glass with a built-in reflector is used. Bulb and reflector unit are mounted to a plate attached to the troffer with four thumb screws, which may be removed to allow plate to drop from position for servicing.



F Spotlights (523)

Two new spotlight units, No. 345 for use with two 40-watt and No. 346 for use with four 40-watt fluorescent commercial fixtures, are offered by Mitchell Mfg. Co. Both models use PAR-38 projector spot or flood lamp, adjustable in any direction by means of gimbal rings. Units may be used individually, inserted between two fixtures or added at either end of rows — flush or stem mounted.

Transformer (524)

G-E is offering a luminous-tube hanger-type transformer for indoor installation. It is approximately half the size and weight of conventional hanger-type units, and has a mounting bracket which makes it equally adaptable to wall or pendant mounting. It is available in six ratings, from 5,000 volts, 18 ma., to 9,000 volts, 18 ma., with either secondary cable leads or secondary electrode receptacles.

F Ballasts (525)

Westinghouse is offering a complete line of ballasts for all commonly used fluorescent lamps, including usual applications in the U.S.A. and 50-cycle and special-voltage sources used by foreign countries.

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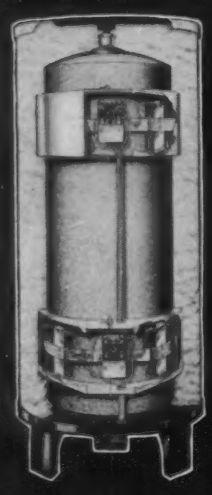
ELECTRIC "LIFE BELTS" for domestic hot water heaters



When water in municipal systems contains minerals and chlorine, it becomes a fairly efficient electrolyte.

To avoid electrolytic corrosion which may occur if dissimiliar metals are in contact with the water, the Toastmaster Water Heater employs "Life-Belt" heating elements attached to the *outside* of the tank. In such an application, the ability of the elements to give long, trouble-free, economical service rests solely upon the quality of the electrical resistance material used. *To assure top-level performance for a lifetime, the McGraw Electric Co., makers of Toastmaster Water Heaters, specifies Nichrome.**

The tank is further protected by McGraw's "Ionodic" system of corrosion prevention. Says the manufacturer: "We guarantee the Toastmaster Water Heater for 10 years—and deem this a conservative commitment. Life-Belt elements last almost indefinitely."

Profit by this example . . . and specify Nichrome. And remember, there are over 80 Driver-Harris alloys designed to fill the needs of the Electrical and Electronic industries—fully described in our catalog R-46.

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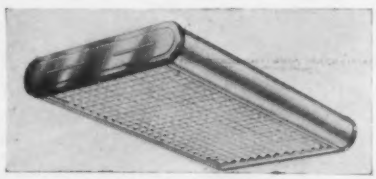
Luminaire (526)

Newest addition to Electro Mfg. Corp.'s basic unit series is the Skylouver. This is a shallow-type, louvered luminaire, five inches from top to bottom. The louvered panels are molded of polystyrene with 45-30 cut-off. Extruded polystyrene crescent shaped side panels are in ribbed plastic; louver and side panels are held to rigid specification in a metal, basket-like hinged frame that is removable for maintenance. All models are for individual or continuous-row installation. Available in two-light (No. 1025) and four-light (No. 1045) models.

New Fixtures (527)

Plastic side panels and louvers are featured in Leader Electric's streamlined New Horizon and Officer models. Tubular plastic is used for side panels because it is translucent and permits a maximum of diffused light directed horizontally. Slimline



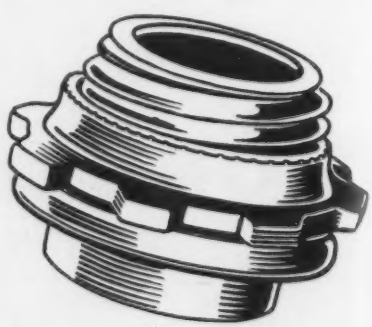
instant-start tubes are another feature of the New Horizon fixtures. The Officer model uses four 40-watt instant-start tubes.

Sterilamp (528)

A 25-watt Slimline germicidal sterilamp, emitting more than twice as much ultraviolet radiation as former lamps, has been announced by Westinghouse. The 36-in. lamp is designed for starterless operation with standard 64T6 slimline fluorescent lamp auxiliaries and will operate in any position. Optimum operation is at room temperature, although satisfactory operation is received down to freezing temperatures, the manufacturer states.

Thinwall Fitting (529)

Tomic Sales & Engineering Co. is making a thinwall fitting, which it claims reduces installation time. This new Tomic No. 10EMT is raintight and is provided with a stainless steel locking washer. Application of the fitting to the tubing causes a flexing of the locking washer which grips the tube and



forms a perfect 6-point ground around the entire tube, according to the manufacturer, who states that no crimp, screw or wrench is required. The fitting can be tapped on with any handy tool or pushed on against a hard surface, it is claimed.

information

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BULLETINS ETC.

Thermostats (530)

Thermostats, along with the company's heat and control engineering service, are described in a new series of leaflets announced by Westinghouse. The first leaflet (B-3954) explains how the "therm-a-neering" service provides thermal and electrical engineers and a development laboratory to assist the manufacturer in handling problems of heat and its application. The second (B-3939) describes and discusses the advantage of three of the Westinghouse line of themostats, the Uni-Therm, Sentinel, and Guardsman. The third (B-3938) describes the Clostemp thermostat designed for storage-type, domestic water heaters. Complete diagrams and photographs are included in all the leaflets.

Instruction Manual (531)

James G. Biddle Co. has released a pocket-size instruction manual for use with the "Ducter" low-resistance ohmmeter, a portable instrument for shop and field use —in production, and on installed electrical conductors and equipment. This 48-page manual contains information on specific types of equipment to be tested and the methods used. Formules, sources of trouble, procedures, methods of tests, etc., are discussed.

Catalog (532)

A 20-page catalog has been released by Sorenson & Co., Inc., manufacturers of standard electronic voltage regulators and d-c power supplies.

Jacks (533)

Information on Simplex jacks is contained in a recent bulletin from Templeton, Kenly & Co. These jacks are distributed by Line Material Co., which reports that some styles, including those most used in the utility field, are carried in its California warehouses.

Condenser Manufacture (534)

Steps in the manufacture of an Allis-Chalmers surface condenser are portrayed in a new 32-page bulletin, "'Let's Watch A Condenser Being Built."

Catalog (535)

P. R. Mallory & Co. has issued a new catalog of its line of electronic and metallurgical products.

Switch Tips (536)

Micro Tips, Vol. 1, No. 1, was released recently by Micro Switch and contains tips from plant men on applications of snap-action switches.

Fan Catalog (537)

Emerson Electric Mfg. Co. has issued a new catalog on its line of fans.

Armor Rods (538)

Preformed Line Products Co. has a new bulletin, giving data on its armor rods.

Lightning Arresters (539)

Line Material heavy-duty valve-type lightning arresters are described in a new bulletin from the company. These arresters come in 1, 3, 6, 9, 12 and 15 kv. The bulletin gives performance and construction data in graphs, oscillograms, cross sections.

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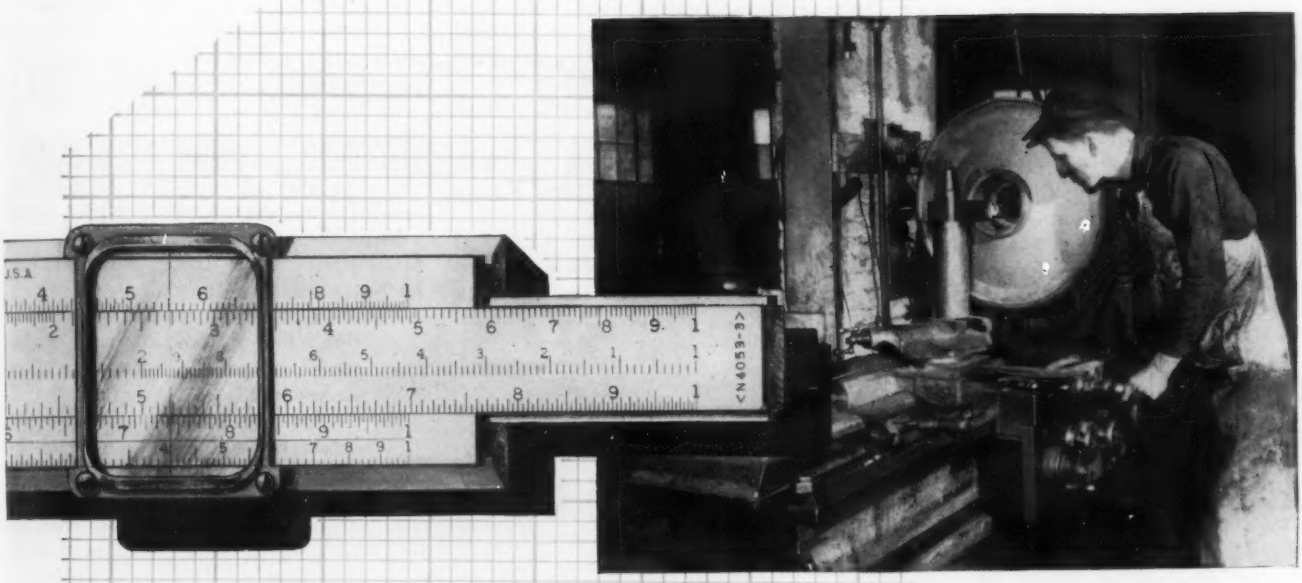

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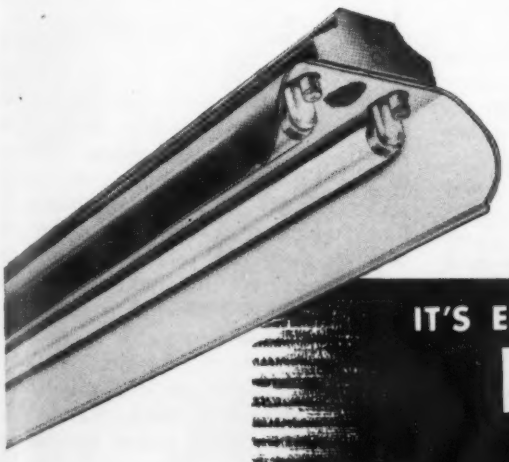
Day-Brite Fluorescent Lighting Fixtures distribute the light evenly without glare, deep shadows or distortion, as required for precision work. They are rigidly constructed and designed for easy installation and carefree maintenance.

Evaluate all these features in dollars and cents and you will find that Day-Brite Fixtures are worth a whole lot more than they cost.

The DAY-LINE heavy-duty industrial fluorescent fixture with porcelain-enameled steel reflectors. Designed for two and three 40-watt and two 100-watt lamps . . . unit or continuous installations. U. S. Patent Nos. 2317434, D-135375 and D-133458.



Day-Brite Lighting, Inc., 5412 Bulwer Avenue, St. Louis 7, Mo.
Nationally distributed through leading electrical supply houses.

In Canada address all inquiries to Amalgamated Electric Corp., Ltd., Toronto 6, Ontario.

006

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE *Lighting*

ELECTRA'S HUSBAND

"WHEE-EE-EOO" The pear shaped whistle or wolf call came out before I could stop it. Electra looked surprised, then, realizing that I had given it, glanced swiftly to what I had seen, and her look at me would have frozen a polar bear. For what had brought such a rise in blood pressure and wind velocity through the lips was a little number in a nightgown, reclining on a settee in front of us. Believe it or not, this was in a Home Show, but need I say that home was never like this. But then, perhaps she was only one of the many, many unattainable gadgets on display there.

Yes, right facing the main entrance, in a beautiful display of home lighting fixtures, in a series of little rooms, was this babe, in a nightie, on a couch, looking coyly at us all—there were hundreds of us gaping at her—murmuring sweetly, "It's easy for me to read with this Decoralite." Who cared about reading, anyway. With some fortitude and a sense of duty to my industry, I raised my eyes from hers to see what she could possibly mean. Oh, that picture in a frame above her head, and which she alternately, by pressing the switch she held in her dainty hand, lighted as a luminous picture or made to shed light downward to read by.

"I suppose you would like one of these 'pictures' yourself," Electra's icy voice said in my ear.

"Not the one on the wall," I smiled at her reaction. "Wouldn't mind the Varga deal on the sofa though, if it could be illuminated a little like that." And as an afterthought. "Don't suppose she's a premium that goes with the purchase of one of those chromos, is she?"

"Hardly," said Electra sweetly, "You'd have to save box tops for that." Or try 'Truth and Consequences.' They give away the darndest things."

"Well my dear," I consoled her, "If you think that bit of femme appeal a bit beyond the scope of a home show in San Francisco, you ought to have been with me at the Los Angeles one last year. Some plumbing outfit down there had a gal in a bath tub. She was bare down as far as the foam in the tub would let you see. There was a big mirror above her so you could look down at her and a huge crowd stayed there a long time hopefully wishing all those tiny bubbles would burst."

"Did they?" asked Electra. "Bath salts don't last forever, you know."

"That's what I thought, but they must have had a special brand for, as long as I waited, she was safe.

"And then down at the Electrical Maintenance Engineers show in Los Angeles last month. The last place in the world you'd expect any glamor.

Lots of industrial stuff, machines and lighting fixtures and wire and motors. Well one of the lighting boys, sensing that all his competition would be there in a blaze of glory, brought in two gals in frilly chorus skirts and long black mesh stockings to pass out the literature he was distributing. Of course it did divert your attention from the lighting units up above. You weren't looking up in that direction. But it surely attracted attention — and comment."

"But does it sell their goods?"

"Why my dear, how practical you are! I suppose it must. As I go around the various engineering offices and manufacturers' and wholesalers' places, oh boy, the calendar gals they have on the walls. In fact you might say the more engineers and the more sedate the office, the more gorgeous calendar gals. Must be some sort of an inverse square law."

"Poor things, no wonder." From Electra. "Spending all day over those drafting boards, they need something to remind them they are human. Most engineers I know need a lot of reminding."

"Now, now." I could see we were in for a ribbing—by an expert. "I've heard tell of some engineers who were a little too human, you might say, at times. But after all, as the song says, a pretty girl is like a melody. One editor of a company employee magazine who used quite a few snappy pictures of pin-up beauties reasoned it out in his own mind this way whenever any of the brass called him on it. 'After all,' said he, 'the majority of my readers are men and all men like to look at beautiful women, so why not give them a little pleasure in life? Their jobs are often pretty darn drab.' And I think he has something there."

"What makes you think that women don't like to look at pretty girls, too?" asked she with a twinkle in her eye.

"Oh well, yours is a different interest. You look them over to see what they are wearing. We look to see what they aren't. That 'new grandma look' robs us of a lot of the joy of life, I may add, madam."

A little way down the aisle in the show was a space selling swimming pools, home-size jobs for the back yard. It is kind of silly selling them in San Francisco where there are no yards and so chill a wind in summer. But they darn near convinced me I should have one by the big color photos they showed on a screen above me — especially that blonde babe in the white bathing suit. Mm! Mm!

No wonder the cost of building a house is so high. Think of the overhead on the blondes.

IN these times of potential power shortages and mandatory "customer cooperation" a note that Electra picked up from a British magazine that I had taken home, may have some merit. As everyone knows, electricity is short in Britain due to the fuel situation. One of the Electricity Boards (municipal undertakings) is giving discounts to householders who save at least ten per cent on their last year's consumption of energy. Says the item, "certainly this device for achieving a reduction in consumption is greatly to be preferred to any form of rationing, taxation or surcharge on 'excessive' consumption." And to think that in the not too distant past, power companies periodically gave "discounts" for increased energy use. Screwy times, these.

17-39% Lighter

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EASIER HANDLING and installation plus better appearance result from the reduction in weight and dimensions of these *improved* distribution transformers. And they were made without any sacrifice in operating characteristics, or mechanical strength. Most of these savings result from use of new preferred oriented electrical core steel.

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(*Preferred types)

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1½-25	*PBSR	*CBSR or PBSR
37½-100	*PBS	*CBS

KEY TO TYPE DESIGNATION

PBSR—High voltage pocket bushings with low voltage stud bushings in tank wall . . . round tank.

PBS—High voltage pocket bushing with low voltage bushings in tank wall . . . semi-elliptical tank.

CBSR—High voltage cover bushings with low voltage stud bushings in tank wall . . . round tank.

CBS — High voltage cover bushings with low voltage stud bushings in tank wall . . . semi-elliptical tank.

SEND FOR BULLETIN 61B6159B on distribution transformers — 1½ to 100 kva, 2400 — 15,000 v.

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to give you more and better insulators...faster!

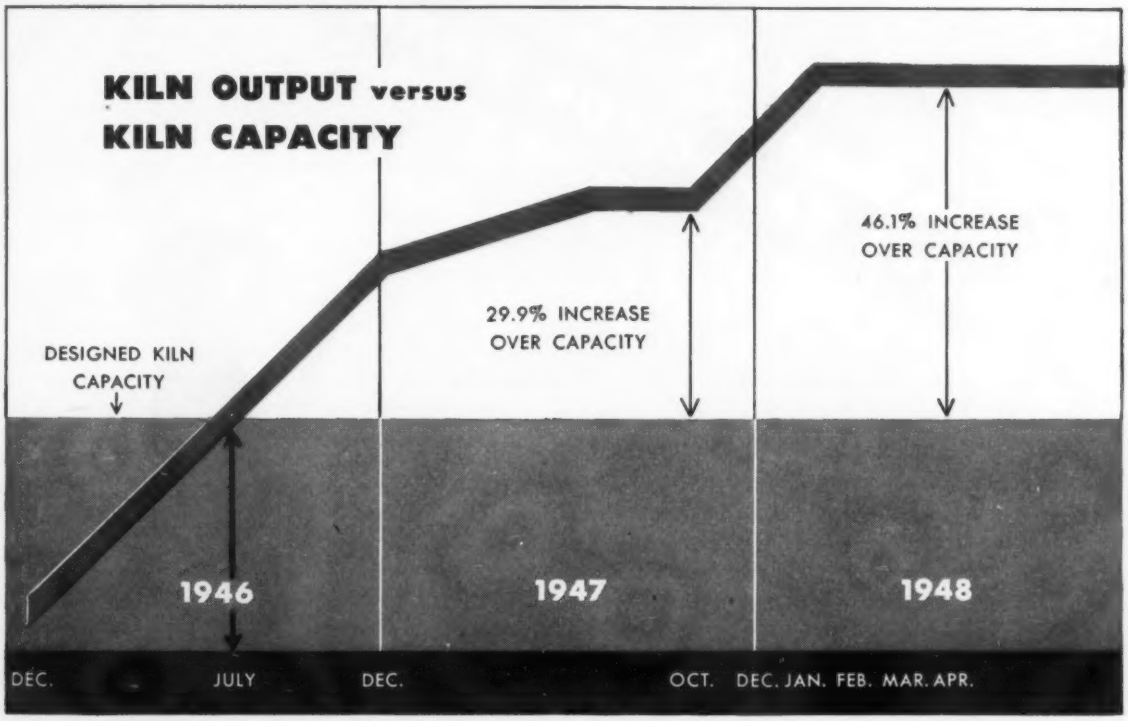
You need more insulators : : : and you need them fast. We're making every effort to see that you get them. Keeping you supplied with all the insulators you need is an obligation and a responsibility which we gladly accept.

To fulfill this responsibility we have made big investments in time, money and effort.

We have modernized and expanded our facilities with the result that our current output now exceeds our pre-war level by 220%.

Naturally, to meet your demands for insulators, there's still lots more for us to do. But we want you to know that tangible progress is being made . . . and that you'll be receiving more and better insulators . . . perhaps faster than you expect!

Remember, for the finest in insulators . . . always see your nearby Locke distributor first.



...before you buy...stop!
see what Locke's got

TO INCREASE OUTPUT 220% we took many steps. For example, take the case of kiln output vs. actual *designed* kiln capacity, see graph above. By employing new methods and procedures we have increased output *over* designed capacity by 46.1% since July, 1946—with 16.2% of this increase coming within the last year! Certainly this indicates that we're making every effort to bring you more insulators, faster . . . and that we're sparing no expense to do so.

in pole line hardware and insulators!

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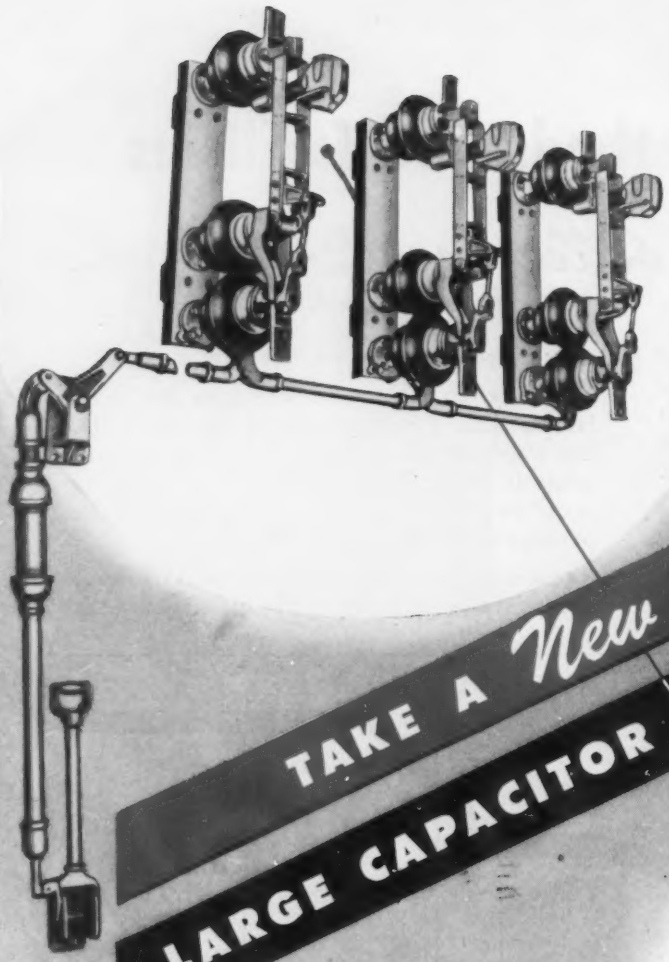

TAKE A *New Look* AT LARGE CAPACITOR BANK SWITCHING

On distribution systems, whenever large capacitor banks have been installed, it has been generally considered necessary to apply oil circuit breakers for switching purposes. However, with the availability of the S & C Interrupter Switch, affording dependable switching at substantial cost savings, the oil circuit breaker is no longer a necessity in this type of application where automatic control is not essential.

The S & C Interrupter Switch has been giving very satisfactory service for more than eight years in a variety of applications up to 15,000 volts. In recent field tests, it has demonstrated positive interrupting reliability in switching large capacitor banks at various voltages.

These tests extended up to 3240 kvar on a 3-phase, 12kv, grounded wye system, and the interrupter switch is now recommended for capacitor application up to that capacity and voltage.

Because the S&C Interrupter Switch may be installed outdoors without any enclosure, installation is flexible and economical. It is made for hook stick as well as group operation.

Catalog information may be obtained by asking for Bulletin 202A.

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MAY 1948 Vol. 100, No. 5

ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.

THE ATOM UP TO DATE

Robert Colborn
McGraw-Hill Bureau
Washington, D. C.

IS AMERICA'S atomic energy program stagnating?

You don't have to talk to very many people in industry or in government today to hear that it is. You can hear that the Atomic Energy Commission has enmeshed itself in red tape and indecisiveness; you can also hear that it is arbitrary and dictatorial.

You can hear both that AEC has sold out to the military and that civilian control of the atom is jeopardizing national security.

One man will tell you that potential civilian applications of nuclear fission are being sidetracked; another will insist that AEC is plotting a nationwide TVA based on atomic energy.

At the same time, there's an increasing tendency to re-examine the basic law, the McMahon Act, which governs atomic energy work. Here too there's a whole series of cross-purposed ideas.

Many of the government people would like to see a lot of technical points in the law clarified in the light of today's understanding of the problems. And they'd like to do something about the multiplicity of committees now required to breath down the neck of Lilienthal and his colleagues. This group is not pushing its ideas because it is deathly afraid of the sweeping and unwelcome changes that might be made in the law if it were ever thrown open for discussion.

What's particularly feared is the recurring talk in Congress of turning atomic energy control back to the armed forces. You'll hear talk of this from Taft people in the Senate, for instance, or around the House Committee on Un-American Activities.

Outside of Congress, there are stirrings of an attack on an even more fundamental tenet of the McMahon Act — the socialization of atomic energy. A few technical people, some businessmen, are beginning to argue that atomic progress would be faster if the whole field were thrown open immediately to industrial development on a profit basis.

A Battle In The Dark

In this jungle of debate, accusations, and complaints, what are the facts?

Is America moving ahead on atomic energy? How fast? And in what direction?

What are the real issues in dispute as to the Atomic Energy Act?

For the businessman trying to gage the eventual impact of atomic energy on his industry, for the citizen trying to form an intelligent opinion on this national issue, the facts are extraordinarily hard to come by. The information that anyone would naturally ask for first—on production rates, costs, resources, and the like—is all stamped top secret. Even the nature of the problems ahead, the technical reasons for policy decisions, the terms of contracts, are obscured, if not hidden, by secrecy requirements.

You can ask the experts, the men who know the classified information. But you have to be careful not to ask two experts. If you do, they'll disagree, and neither is allowed to tell you the basis for his conclusions.

In this situation, ELECTRICAL WEST has re-examined the whole atomic energy program, starting from a background of close coverage of the subject ever since Hiroshima. We didn't ask for, and didn't get, any secret information. But we have talked to government officials, both in and out of AEC. We have visited every major atom plant and laboratory. We have conferred with industrial leaders—both those involved in the atom program and those who have chosen not to be involved.

We think we have as clear a picture of the situation as is available to an outsider.

Briefly, these are the conclusions we have reached:

The short run—The atom management's number one job, of course, is to keep the war-built plants running, to maintain the bomb production achieved by the Manhattan District.

On this, there has been no faltering, no interruption of production.

At Oak Ridge, efficiency in the separation of fissionable uranium has been greatly stepped up. At Hanford, production of plutonium has been maintained in the face of great technical obstacles. At Los Alamos, manufacture of the electronic and mechanical apparatus of the bomb has been headed from a laboratory toward a factory operation.

Next steps—Equally important, for the long haul, with operation of existing plants is the job of picking up where the Manhattan District left off, of advancing the atomic art.

In military terms, this means: does the U.S. wait for the rest of the world to catch up with its wartime achievements, or does it push ahead with the development of better weapons and more of them so as to keep its present lead?

In technical terms: are Americans learning more about what goes on in the atomic nucleous, about how to control atomic reactions; are the theoretical possibilities being reduced to engineering practice?

At this level, no such unqualified endorsement as the short-term job has earned can yet be given to the government's atom program.

Six months or so ago it would have been necessary to report that the forward-thrusting phase of atom work was in a state of near stagnation. For example:

Preparations for a new and bigger

plutonium plant—AEC's highest priority project—were enmeshed in the engineering and personnel difficulties of a new staff tackling a tremendous job.

Weapons research was at loose ends. It was operating in a vacuum without guidance from either the military or the Atomic Energy Commission.

Construction of new types of atomic reactors, the key devices for utilization of nuclear fission, was being held up by vacillation and indecision in the Atomic Energy Commission.

Throughout the atom project morale was low. Many technical people were leaving; many of those who remained were discouraged and uncertain. They were conscious of a lack of direction and impetus. Unable to get Washington approval on new programs, they often were reduced to marking time.

Many of the government and industry people and scientists who had fought hardest for appointment and confirmation of a civilian commission were beginning to feel that their efforts had been wasted. In some cases they were only restrained from attacking AEC by the fear that something worse would replace it.

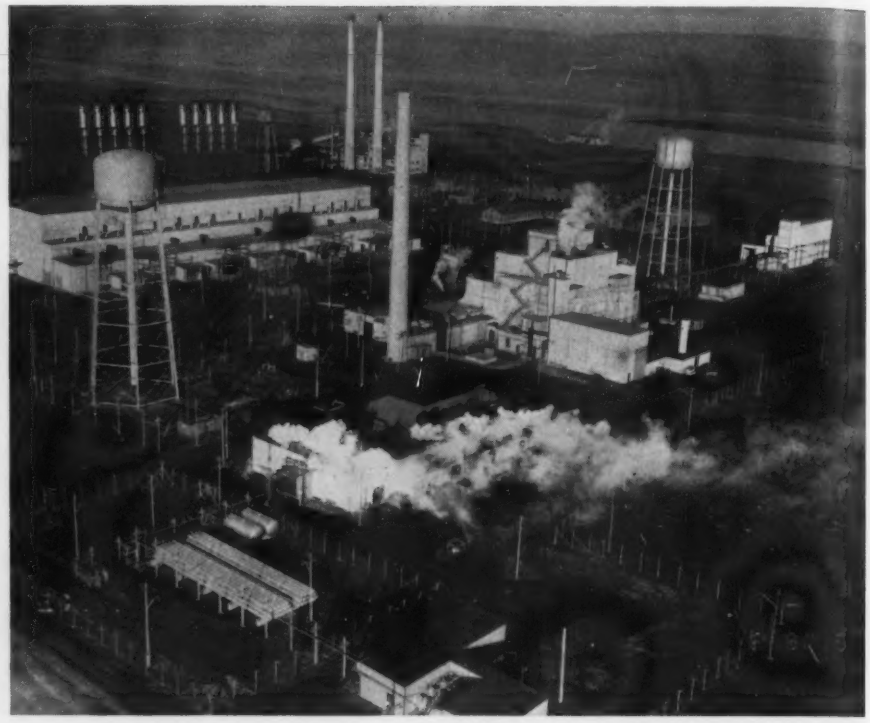
That was late last summer. And that was the bottom. At just about that time the year old AEC began to get a grip on its huge job. Things began to improve. Today the situation is still spotty, good here, bad there, but everywhere it is visibly on the mend.

An early and fruitful step was the appointment of an able group of regional administrators who could give local leadership to the atom projects. These men were granted a large measure of autonomy. At Hanford and Oak Ridge, for instance, the local men can OK expenditures up to $5 million without reference to Washington; this is almost unprecedented in government. And this frees the operating contractors at the sites from a tremendous amount of waiting on Washington.

Additional contractors were brought in to beef up the design force on the new plutonium plant at Hanford, and this program is now rolling. Design is well along; preliminary construction work is already under way and will reach a high level later this year. The whole Hanford project radiates nerve and enthusiasm.

Weaponeering at Los Alamos still has a long way to go to match the drive of Hanford. But at least a research program has now been agreed on among AEC, the military, and the scientific laboratory, and the laboratory is squaring away to undertake it.

Similarly, in the reactor program, the designers are ready to go now on three or four new piles that have been awaiting the nod from Washington for a year or more. In a radical reorganization of the reactor program, work which had been divided between the Clinton Laboratory and Oak Ridge—a trouble spot for several years—and the Argonne National Laboratory at Chicago has now been constructed at the Argonne.



One of main production areas at Hanford Works on Columbia in Washington

To What End—The program which AEC has now taken off dead center and is beginning to push along is above all things an armament program. The way the world goes now, the commissioners figure that production of bombs takes precedence over everything else.

The publicity still goes to the civilian applications of atomic energy—actual or potential. In almost weekly speeches the commissioners have been emphasizing that there's more to the atom than explosives. But the fact is that something around 80% of the AEC's money and effort is directly aimed at maintaining and increasing the production of bombs.

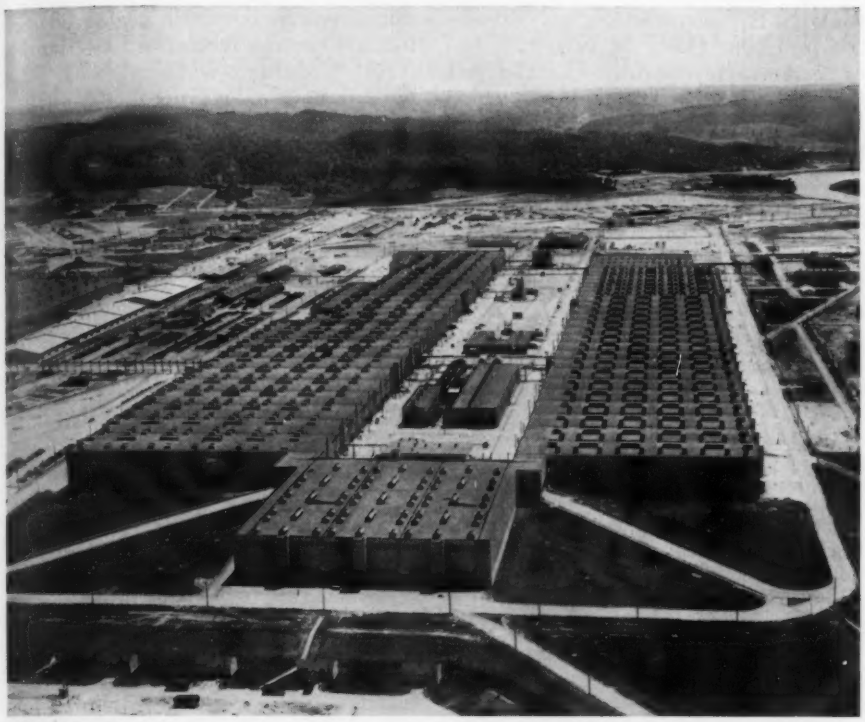
This concentration of weaponeering inevitably has a retarding effect on civilian applications. The most immediate application—production and distribution of radioisotopes — doesn't compete seriously for material or engineering talent. That's why it has been able to forge ahead rapidly.

But application of the atom's power to non-destructive uses does definitely compete for both material and talent. The result is that work in this field has had to be laid on a rather slow schedule that puts economically significant power utilization a generation away. In order to economize on engineering talent, particularly, the power work is largely being put into academic hands; AEC's industrial contractors are being discouraged from putting too much effort into power.

Power problems in general are being tackled in a conservative, step-by-step way. The wartime method of bulling ahead, of taking the long jump, of trying to apply right away the extreme theoretical possibility—this has been dropped. The approach now is to precede each short step forward by exhaustive analysis and investigation, to take no chances on building something that won't work.

Not only is AEC's program a military one—it is a rather narrowly military one. Even such projects as atomic propulsion of warships, bombing planes, and missiles are subordinated to production of explosives. This policy is disturbing even to some people in the armed forces. The Air Force has been indignant over the low priority granted to the NEPA (Nuclear Energy for Propulsion of Aircraft) project. And a year ago Admiral Parsons, head of the Navy's atomic weapons unit, was arguing that industrial applications of atomic power (supplying decentralized plants, for instance) might have as much military significance as bombs themselves.

On the industry side, much of AEC's difficulty in attracting contractors, in laying a broad base of industrial par-



Gaseous diffusion plant at Oak Ridge, Tenn. (Atomic Energy Commission photos)

ticipation in atom work, is traceable to the postponement of economically interesting applications.

The Socialized Atom

One effect of the AEC's slow start has been to contribute to a feeling among some industry people that the McMahon Act took the wrong track when it put atomic development primarily into government hands. This is distinctly a minority feeling at present —a rather surprisingly small minority considering the radical nature of the law.

Atomic energy, under the McMahon Act, has been described as an island of socialism in a sea of private enterprise. It's not quite that unique; synthetic rubber has similar government sponsorship, and synthetic oil appears to be moving in the same direction. But never before has so potentially important a technology been subjected so completely to public control.

Production of fissionable material (bomb stuff) is now overwhelmingly the biggest part of the atom industry. This, and the production of atomic weapons, has been made a government monopoly. It is illegal for anyone to produce or possess either uranium 235 or plutonium, except as a government contractor or except in negligible quantities incident to other activity.

All other atom work except research is subject to government control through a system of federal licensing.

At any time when AEC concludes that commercially useful results can be obtained from atomic processes it must, before it may grant a license to any firm, report on the matter to Congress and give the legislators 90 days to study the subject.

Atomic patent policy corresponds with this set-up. Since a patent's promise of a private monopoly offers no incentive to research in an area which is already a government monopoly, patents are wiped out so far as production of fissionables is concerned. Instead, provision is made for a system of government rewards for discoveries; the amounts are to be set by AEC subject to court review.

Patents are permitted in the other atomic fields, the fields subject to regulation rather than monopoly. But these patents are limited by a requirement that they must be licensed to others at a reasonable royalty, if AEC so directs.

Theoretically, private atom work is possible under this law. A firm could finance and carry on research. If it made a discovery in the field of production it could claim a special government award. Or, on the basis of an application discovery requiring use of fissionable materials, it could seek a license and go into business. But the prospect is hardly very attractive. There's no promise of an exclusive patent protection in a discovery. And there's complete uncertainty as to future federal policy. Essentially, the atom today is the government's baby.

The atom was socialized in 1946 with a minimum of debate or discussion. The arguments centered around a subordinate issue: how much influence should the military exert over government atom controls. But the major motives for socialization appear to have been these:

1. The present law is explicitly temporary, intended only to cover the interim period before profitable application of atomic work is possible. So the role of private industry was left for later determination.

2. Two years ago international control of atomic energy looked imminent. It was feared that to permit private exploitation of the atom might create vested interests which would stand in the way of international arrangements.

3. There was some fear that private researchers, building on the government's $2 billion investment, might patent some basic discovery that could lead to monopolization of the whole field.

4. National security considerations, it was felt, made it necessary for the government to allocate closely material supplies and manpower in this field in order to ensure that military requirements were not slighted. And the simplest way to do that seemed to be to throw the whole job to the government.

Today some businessmen are beginning to argue that most of these points are now obsolete. If the government's monopoly were eliminated and normal patent incentives restored throughout the atomic field, they insist, private money would flow in and atomic development would go forward in a manner more businesslike, faster, and cheaper.

The first atomic bomb was completed in July 1945. It was charged with plutonium and was detonated on the sixteenth at Alamagordo, N. M.

Two weeks later a uranium bomb was dropped on Hiroshima, and three days after that another plutonium bomb was dropped on Nagasaki. At that point, the United States had exhausted its supply of bombs.

For nearly three years, since then, the atom bomb plants have been running day and night building up a stockpile of bombs. How fast? People who have any information refrain from guessing. But a common view among men who only know what they read in the Smyth report is that talk of production rates in the hundreds or thousands of bombs is fantastic.

Whatever the rate actually is, it is scheduled to be maintained until late next year or early 1950. At that time, new facilities at Hanford, Wash., will begin to bring in additional production. By 1951 or 1952, when these facilities are completed, total bomb production should be increased.

That, so far as an outsider can gather from the published information, is the present status of the armament program to which AEC devotes the major part of the $600 million or so it spends every year. Some such analysis as this is undoubtedly the basis on which other nations gage the military power of the United States.

The United States came out of the war with a bomb industry consisting of four major plants: two at Oak Ridge to separate the natural explosive, uranium 235; one at Hanford to produce the synthetic explosive, plutonium; one at Los Alamos to assemble bombs using these explosives.

There is one non-military dividend from the atom program which is being paid already. That's the availability of cheap, plentiful radioisotopes. What makes this important is that the radioisotope is a basic tool for measurement and observation. It is being used today in nearly every branch of science and, increasingly, in wide areas of industrial experiment.

Perhaps a little overenthusiastically, the introduction of this new tool is being compared to the development of the microscope.

For businessmen, the isotope field has another interest. It is about to be commercialized, to be put on a profit-making basis.

Starting in the next few months, and for several years thereafter, the isotope business is going to provide a training ground for the Atomic Energy Commission and a working demonstration of how well or ill commercial enterprise can fare in territory dominated by AEC.

Atomic Power

The key fact about development of useful power from atomic energy is that no one in the United States needs atomic power very badly.

What atomic energy could provide in the near future, most technicians guess, is a practically unlimited source of electric power which would be a little cheaper, perhaps, than power from coal, more expensive, almost certainly than hydroelectric power. Its most peculiar economic characteristic would be that so far as fuel is concerned, it would cost about the same anywhere—on top of the Andes or in New York City; the plant manager could bring the day's fuel to work in his briefcase.

To a nation which possesses a 2,000-year reserve of coal, such a prospect is not terribly exciting—economically speaking—to anyone outside the fuel business. Conceivably, it might change the cost factors in plant location of some U. S. electroprocess industries—moving them closer to raw materials or markets. However, the University of Chicago's Cowles Commission, which has been making a study of transportation-free 4-mill power, thinks not.

Power Plant Possibilities

It is considerations like these rather than technical factors which set the time scale for useful atomic energy. You can find competent technical people who are confident that on a work-it-out-as-you-go-along engineering basis they could deliver you, if you wanted it, a commercial-size reasonably economical power plant along about 1952.

But the AEC doesn't want it much. The commission is scheduling its power work to produce an economic plant sometime around 1960. Throughout the sixties it looks for steady installation of additional plants, so that by 1970 atomic energy might be supplying 20-25% of the country's power needs.

The rest of the world, however, is not likely to be so casual about power possibilities. The Cowles Commission thinks that on the central European plain—the Balkans and Western Russia—there's a combination of developed industry, fuel scarcity, and expensive transportation that would make atomic power attractive.

The coal-starved British, who have budgeted about $120 million for atom work, are believed to be stressing power development in their program.

So the first substantial power plants may well appear outside the U. S.

The one exception of U. S. indifference about power plants may turn out, curiously enough, to be the Air Forces. Their NEPA project is built on the long-jump psychology that went from a wiggle on an oscilloscope in 1939 to Hiroshima in 1945. With Fairchild Engine & Airplane Co. as principle contractor, the object is to try to build right away an atomic power plant for an airplane.

When you remember that today's heavy bombers carry as much as 40 tons of gasoline (which a NEPA engine wouldn't need) this doesn't seem as fantastic as it does at first glance. But even so, the "respectable" atom people are pretty scornful of NEPA. They're sure the only sound route is through stationary power plants, to ship propulsion, and eventually to aircraft. The friendliest of them feel toward NEPA much as a man who is holding down a steady job with a future might feel toward his flyer in the grain market.

The only nuclear reactor in existence today which is capable of delivering its energy output in usable form is the fast neutron reactor at Los Alamos, N. M. This unit is fueled with pure plutonium, employs no moderator, is essentially a controlled bomb.

This reactor, which went into operation in November 1946, delivers its energy at a fairly high, and therefore usable, temperature. It is described at Los Alamos as "a watch-charm model of a power plant." Its primary purpose is the study of bomb physics, but it is producing information which will be valuable if, as some expect, practical power plants turn out to resemble bombs more than they do the huge Hanford piles.

The second high-temperature pile due to come in is one at Brookhaven National Laboratory on Long Island, which is now under construction and should be completed next year. This may actually deliver a little electric power; AEC hasn't decided yet.

The decision is more a public relations than a technical one. Brookhaven pile is simply a quickly designed tool to produce neutron beams and perform irradiations. It is pretty much a copy of the existing pile at Oak Ridge—air-cooled, carbon moderated, fueled with natural uranium. However it will operate at a higher power level than Oak Ridge's 100 kw. and its cooling air will emerge hot enough to generate steam. The limit on its temperature is the heat-resistance of the aluminum jackets which protect the uranium from corrosion.

Space is being left in the design for a heat exchanger. But any power generated won't even be enough to run wind-tunnel-size blowers that force cooling air through the pile.

The first reactor that can reasonably be considered a pilot plant for power generation is the Zinn pile at the Argonne National Laboratory in Chicago. Construction work on this only awaits final AEC approval. As a matter of fact, Argonne was ready to start a year ago. This will take a year and a half to two years to build.

The Zinn pile's primary purpose will be research, but it is being designed to do a workmanlike job of getting the power out in usable form. It will be a fast-neutron reactor using concentrated fuel, will operate at a fairly high power level and at a temperature comparable to that of a modern steam plant.

Two reactors specifically designed to produce electric power are on the AEC docket, but neither is in a very active condition.

One is the Daniels pile first projected by the Manhattan District in 1946 and then scheduled for completion this year. Like the Brookhaven

pile, it was intended to be a modification of the Oak Ridge pile, run at a high enough temperature to generate steam.

When AEC took over from the Manhattan District, it didn't think much of the Daniels pile, figured it was intended to produce publicity rather than knowledge. So this project has been in abeyance ever since. Desultory design work is being done, and this year responsibility for it was transferred from Oak Ridge to the Argonne, where most pile work is being centralized, but it is doubtful whether it will ever be built.

The other straight power project is the General Electric reactor scheduled to be built at the Knolls Atomic Power Laboratory near Schenectady. No information has been furnished about this pile except that it will eventually run at a high enough power level to provide a practical demonstration of the operating problems to be expected in a commercial-size plant.

Design of the G-E pile is now underway, but it is being held back by the expansion program at Hanford. The Knolls people have had to devote a large share of their attention to the research needs of the Hanford work, and it appears likely to be some time before construction of the pile can start.

During the past year a number of the technical problems standing in the way of power production have come close to solution.

On the problem of a heat-transfer fluid, of which much was heard a year ago, it now looks as if the Smyth Report's suggestion of liquid sodium, alloyed with potassium to lower its melting point, would turn out well. Sodium doesn't absorb neutrons, does not become seriously radioactive, has good thermal properties. It does react violently with water. However a special heat exchanger has been developed —somewhat complicated but workable —to obviate trouble from this source.

Nor does the problem of structural materials for reactors now look as appalling as it did a year ago. Metallic titanium is being considered as a major load-carrying material which could resist pile temperatures which may eventually run, it is thought, as high as 2,000 to 2,500°F.

AEC metallurgists are studying structural properties of a lot of unfamiliar metals, such as beryllium and zirconium, which in the past have been interesting mainly as alloying agents. Some of these have nuclear properties which make them valuable in themselves.

Some of this work is already producing valuable by-products. Discovery of ways to roll and extrude beryllium, for instance, has resulted in improved windows for X-ray tubes.

Similarly the elaborate chemical engineering studies involved in the design of the new Hanford plutonium plant are expected to work out separation methods basically applicable to power plants as well as to plutonium producers.

Fuel Breeds Fuel

During the past year, too, declassification of information on the breeding problem has clarified one fundamental question: is nuclear fuel so scarce that atomic energy must always be regarded as a special-purpose affair to be rigidly conserved? Or is it plentiful enough to be regarded as a major power resource?

Uranium itself is a fairly plentiful metal. However, only one part in 140 of it is naturally fissionable. If that were all, atomic energy would be a rarity very soon.

But when fissionable U235 is consumed in a reactor, producing power in the process, some of the U238 is transmuted into fissionable plutonium. This increases the potential supply of fuel.

Then the question is: when you burn a pound of U235, how much plutonium do you get? Suppose you only got half a pound. Burning that half pound would produce a quarter pound, and so on. You'd end up able to use only one part in 70 of the total uranium. Still not good.

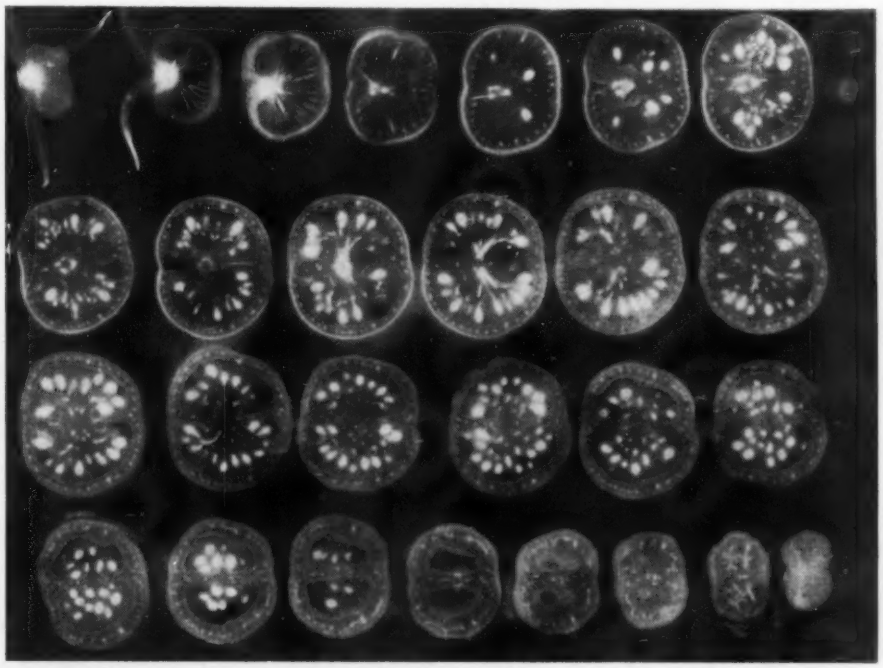
But suppose you get a pound of plutonium out for each pound of fuel burned. Then you can eventually utilize all the uranium. And if you could get out more than a pound of plutonium, you'd have a "breeder pile" which would constantly produce extra fuel for use in other piles.

The same question applies to thorium, which is more plentiful than uranium. Exposed to a chain reaction, thorium is transmuted to fissionable U233. If at least one-to-one breeding is possible, this fact adds thorium to the potential energy supply. Otherwise it is just a scientific curiosity.

So what about breeding? Theoretically, it is possible: when a U235 atom splits, it throws out, on the average, something over 2.2 neutrons. One of these is needed to split another U235 atom and keep the chain reaction going. If another neutron is used to transmute a U238 atom into plutonium, that leaves a margin for losses —if the losses are small enough.

AEC's guarded comments indicate that in present piles the neutron losses are too great to permit breeding. But it is believed that the new piles now on the drafting boards would be efficient enough to breed fuel.

If it works out, that makes atomic energy a thousand-year resource or better. And people who like to worry about the fate of their descendants fifty generations away can take comfort from this thought: though there is no reason to look for coal or oil there, the moon should have lots of uranium and thorium.



Radioautographs on radioactive phosphorus in tomatoes. (AEC photograph)

LATE SNOWS EASE DROUGHT

Paul A. Ewing
Senior Irrigation Economist

R. A. Work
Senior Irrigation Engineer

U. S. Soil Conservation Service

EASING of the near-critical drought in California, continued deficiencies in Nevada and Arizona, but plenty of water in the remaining Western states. These are the highlights of water-supply forecasts based on April 1 snow surveys by the Division of Irrigation and Water Conservation, U. S. Soil Conservation Service.

Following is a state-by-state summary of 1948 prospects, which are much the same as the general picture was for 1947:

Arizona—The long-continued water shortage throughout the main irrigated areas still persists. Total amount of water held in the nine important reservoirs, most important factor in irrigation supply, is only 10% of their total capacity. Apparently another season of heavy pumping from ground storage is in prospect.

California — Although the state is still faced with a short water year, the outlook has improved a lot since snow surveys made early in March which showed such a poor pack that the outlook was for a record dry year similar to 1924. During March more snow fell than during the three preceding months, and by early April the outlook was equal to or better than last year. The assured runoff from the combined areas of the Sacramento and San Joaquin Valley watersheds is expected to be 51% of normal. Last year the corresponding over-all runoff figure was 49%. Except for Shasta and one or two other reservoirs, water stored is less than last year.

Colorado—Summer flow of Colorado River and its tributaries is expected to be from 10 to 30% above normal. Snow cover is well above normal, and seasonal precipitation over the western slope has been much above average. On the South Platte drainage, snow cover is slightly less than last year but substantially above the 13-year average. Reservoir storage is more than last year; many are practically full already. The outlook for the Rio Grande in Colorado is the best in years. Reservoir storage is in excess of last year and above-normal streamflow is expected.

Idaho — State-wide prospects are mostly fair, but are slightly better than fair for Clearwater River drainage. On all southern drainages having storage facilities supplies will suffice for irrigation with careful use. In northern areas danger of a possible flood hazard has been eased by a March snowfall below normal.

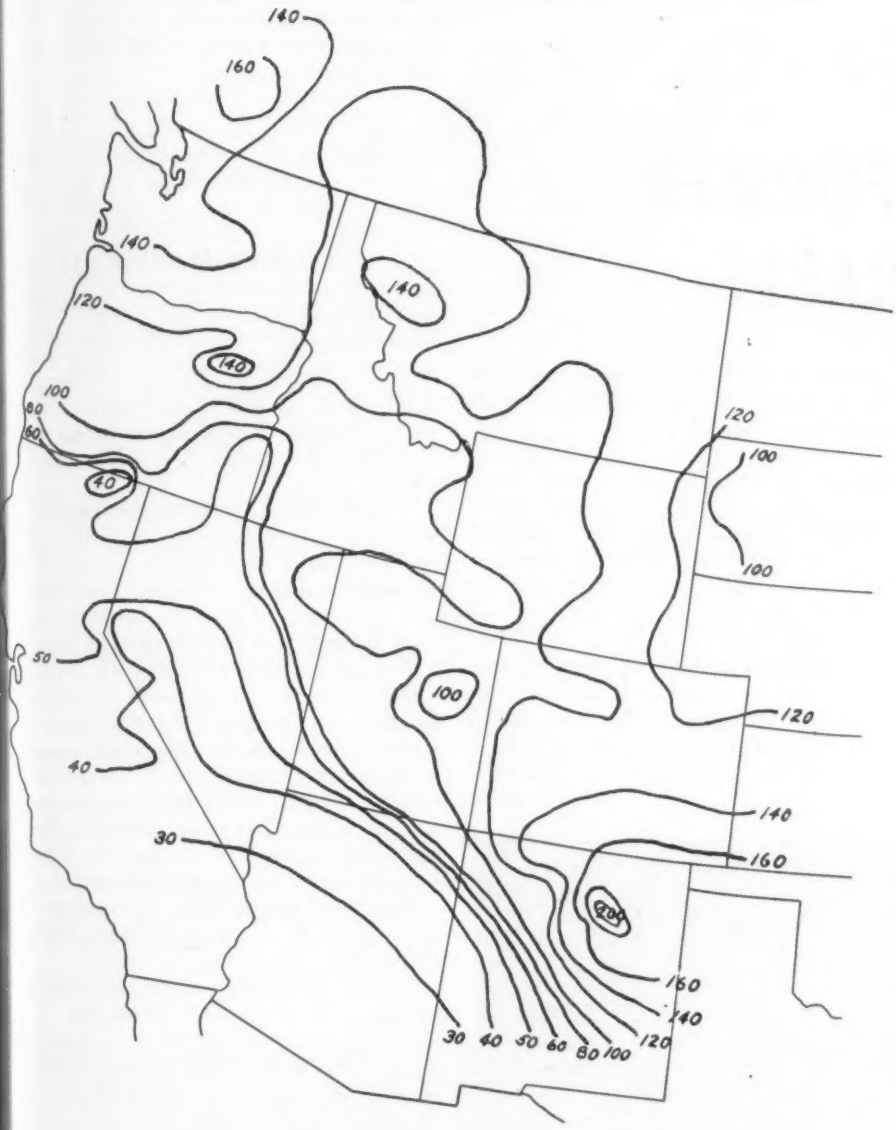
Montana — Snow accumulation on the headwaters of Missouri Basin streams continues above average except on the Madison and Milk rivers. Although summer flow of these two streams is expected to be light, in general flows will be from 10 to 20% above normal. Reservoir storage is about the same as last year but substantially above the ten-year average.

Nevada—Water for irrigation will be in short supply throughout the state. Runoff from the Sierra will

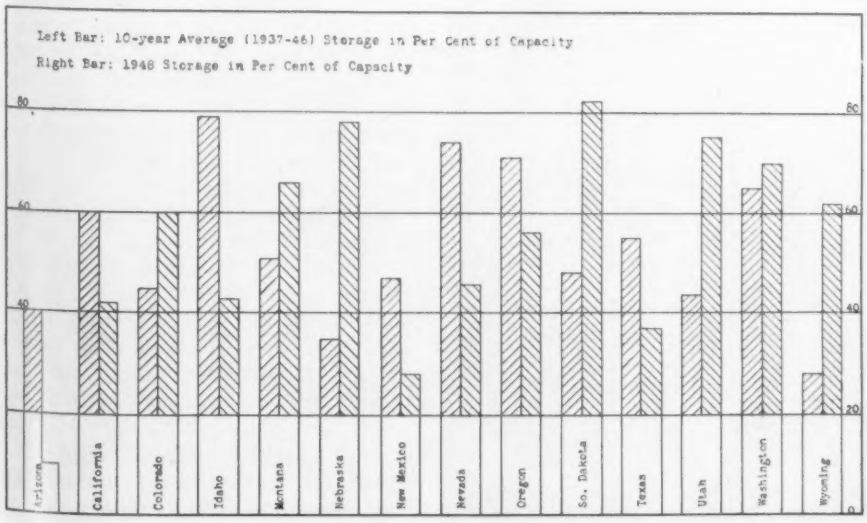
U. S. Soil Conservation Service Photos

Prospective April-September Stream Flow

Figures are per cent of 1937-46 average



Storage Situation in Western Reservoirs



range from 25 to 50% of normal, and from normal to 60% of normal on headwaters of the Humboldt and its main stem. Snow-stored water on the Sierra is generally less than 50% of normal, but a 50% increase in snowfall during March brought the pack on the Humboldt headwater basin nearly up to normal. Reservoir storage is poor, being only about 45% of last year. Lake Mead, however, holds about 115% of last year's storage.

New Mexico — Conditions in this area are the best since 1942. Stream flows substantially above normal are expected in the Rio Grande tributaries except Chama River. Snow cover on this watershed is not as good as elsewhere, and storage in El Vado reservoir is below normal. Elephant Butte storage is also low, but early runoff will add to it materially.

Oregon—In many areas 1948 will be comparable to the good water year of 1946. About 97% of all irrigated lands have in sight good to fair water supplies. Water stored in all reservoirs is about 20% less than last year. Mountain snow cover is above average on nearly three-fourths of all measured snow courses and is greater than last year at all stations.

Utah — Most watersheds will produce runoff sufficient to meet irrigation needs. Practically all streams will discharge at least 80% of their average runoff. Flood discharges of most streams threaten to be enough higher than a year ago to damage some irrigation systems and farm lands during the spring months. Storage generally is at high levels, with the principal reservoirs at 75% of capacity. Storage users should have adequate supplies through the season and many reservoirs will carry water over to 1949.

Washington—Enough water will be available for all purposes, including hydroelectric power generation at Grand Coulee and Bonneville. The April-September flow of the Columbia River at The Dalles is forecast at 94,000,000 acre-ft., which compares with a ten-year maximum of 112,591,000 acre-ft. (in 1943) and a minimum of 57,320,000 acre-ft. (in 1944).

Wyoming—Flows of all streams east of the Rocky Mountains will be slightly above normal. On the west slope of the Rockies conditions are less favorable, and it is anticipated that the flow of the Green River will be 20% below normal. Snow cover is less than last year but somewhat greater than normal, except on the Green River. Because of the large carryover storage in the North Platte reservoirs, an ample supply of stored water is assured.

British Columbia—The 1948 water-supply outlook for southern British

Columbia is very good, with above-normal runoff expected from all streams in the Kootenai - Columbia Basin. The probable runoff from the Okanogan watershed will be about normal. The North Thompson River at Barriere and the inflows to Powell Lake and Stave Lake will be well above normal.

Detailed Forecasts Available

Reports detailing the results upon which the foregoing summaries are based may be obtained by addressing the Division of Irrigation and Water Conservation, Soil Conservation Service, College Hill, Box D, Logan, Utah. Requests should identify the state or drainage basin about which information is wanted.

FEWER TRANSFORMER RATINGS DESIRABLE

Lindsay M. Applegate
Electrical Engineer
Portland

DESIRABILITY of decreasing the number of sizes of distribution transformers for economy in manufacture and warehousing has long been recognized throughout the industry. The need has been recently expressed by Falls and Forbes of General Electric Co. as follows: "The number of available types and sizes of distribution transformers is so great as to be a serious handicap to repetitive production, and hence to the goal of high-quality transformers at the lowest possible cost . . . By eliminating comparatively few kva. ratings, the number of separate designs of transformers which must be built and carried in stock will be reduced materially, with resulting benefits to both manufacturer and user."

Two sizes, 1½ and 7½ kw., seem certain to be eliminated, and some other sizes combined into new intermediate ratings. These are desirable changes, but more complete revision of ratings will promote economy by further decreasing the number of stock sizes.

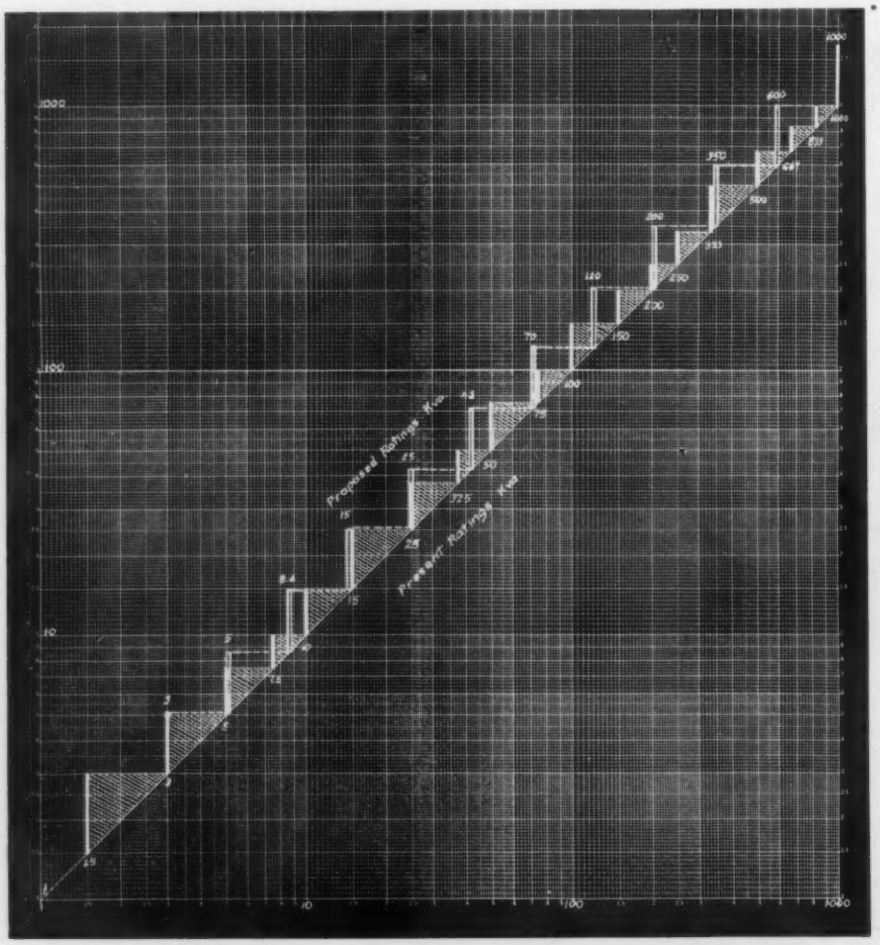
Traditional ratings of transformers based on the habit of thinking in terms of 5 and 10, together with thirds of 1,000, 2,000, etc., giving 333, 667, etc., are characterized by lack of uniformity in the percentage increase from one rating to the next. A more nearly constant percentage increase in steps between ratings would result in a minimum number of transformer sizes.

A comparison between the present sequence of ratings and a proposed constant ratio sequence is shown in the accompanying diagram. The solid vertical lines represent the present ratings. Each line is drawn upward from a 45° log-log line at the point corresponding to the rating with a height reaching to the next rating. The triangle under each step has been cross-hatched for emphasis to illustrate the relative size of steps between successive ratings. The open lines or the open-line extensions above the solid lines indicate the suggested ratings.

Suggested ratings have been selected so that each is approximately 70% larger than the preceding rating. The precisely calculated, logically ideal ratings are, in several instances, so close to existing ratings that no change is needed. Relationships of present, ideal, and proposed ratings are shown in the accompanying table.

In the first column the present ratings are given. The second column gives the ideal ratings based on each rating being 1.696 times the preceding rating. The ratio of this ideally calculated rating to the nearest existing rating is given in the third column. Suggested practical ratings obtained by rounding off the calculated ratings are given in the fourth column. Existing ratings that can be used for the proposed ratings, either without change or by minor redesign, are given in the last column.

Over-all effect of this allocation of ratings is to reduce the total number (not counting 1½ kva.) from 18 to 12. Six of the old ratings are retained without change. Five ratings are within 15% of the corresponding existing



Proposed revision of single-phase transformer ratings would give constant percent increase between any two ratings

ratings. One rating, 120 kva., is 20% different from the nearest old rating.

The arrangement illustrated in the diagram provides a convenient way of laying out any considered selection of ratings. Equal spacing of steps automatically provides the same percentage increase from one rating to the next. If a changing percentage between ratings from one end of the ratings to the other is desired, this can be obtained by drawing the steps between the one-to-one slope (45°) line and a line drawn above at a slightly greater or lesser slope. The percentage change between ratings will be in proportion to the size of the steps between the lines. The proposed 12 ratings have been selected from several alternative sequences, but there may be some other sequence of ratings that would meet with more ready acceptance. Certainly there is some sequence of ratings that would be preferable to the uneconomical one now in vogue.

Comparison of Present and Proposed Transformer Ratings

Present Ratings Kva.	Constant Per cent Step Ratings	Ratio Constant Per cent to Present Ratings	Suggested Rating	Adaptable Present Rating
1.5				
3	3.000	1.00	3	3
5	5.088	1.02	5	5
7.5	8.629	1.15	8.6	7.5
10				
15	14.635	0.98	15	15
25	24.821	0.99	25	25
37.5	42.096	1.12	42	37.5
50				
75	71.395	0.95	70	75
100	121.09	1.21	120	100
150				
200	205.37	1.03	200	200
250				
333	348.31	1.05	350	333
500	590.73	0.89	600	667
667				
833				
1000	1000.00	1.00	1000	1000

RAILROAD ELECTRIFICATION—POWER

Railroad electrification and low-cost hydroelectric power go hand-in-hand. Shown is one of two new 360-ton, 5,000-hp. electric locomotives (largest of their type in the world) built by General Electric for the Great Northern Railway. These modern electrics now operate over the line's 73-mile electrified section over the Cascades. Being built primarily for heavy mountain service, these 11,000-volt, 25-cycle, single-phase motor-generator locomotives have a continuous rating of 5,000 hp. at the rail with a tractive effort of 119,000 lb. Rumor has it that Great Northern will soon embark on a new electrification program on its lines in the West. Increasing price of diesel fuel and cooperation in a national oil conservation program would be factors it is said—these, plus the proved advantages of electrification.

To provide for the growing power needs of the Pacific Northwest, including possibly extensive main-line railroad electrification, one of the large federal projects under study by the USBR is that at Hell's Canyon on the Snake River (Oregon-Idaho). Project would have 742-ft. dam—highest in the world. Storage would be 4½ million acre-ft. supplying a power plant with 900,000 kw. capacity.

Aerial Cable To Combat Rising Costs

N. K. Yarnell

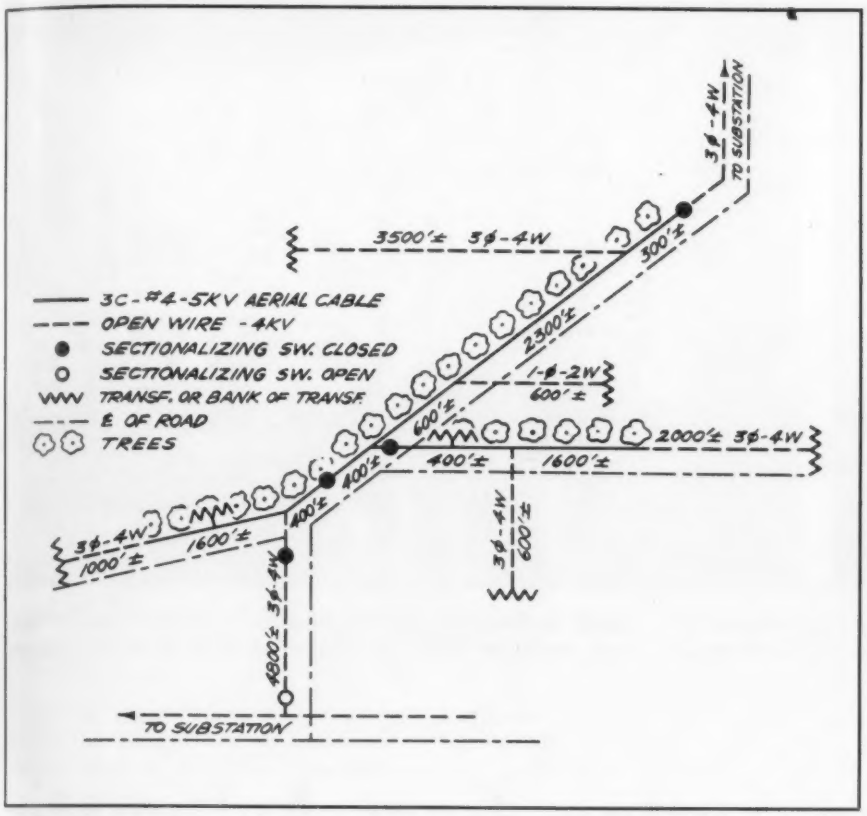
Southern California Edison Co.

RISING maintenance and repair costs on open-wire distribution circuits subject to tree damage, and increased importance of continuity of service recently moved the Southern California Edison Co. to try for the first time an installation of three-phase aerial cable. The trial installation of some 7,600 ft. of 5-kv. non-shielded, reverse-lay, self-supporting cable as part of a 4-kv., 4-wire multigrounded neutral circuit was made near Oxnard, California, where a windbreak of eucalyptus trees was adjacent to the existing open-wire circuit.

Individual color-coded phase conductors are covered with a neoprene jacket and insulated with an oil-base compound. The three insulated and jacketed cables are bound to a 3/8-in. messenger which also serves as the neutral conductor. The messenger is grounded at each end of the run and each tap, and at intervals not to exceed 800 ft. Lightning arrestors are installed at all points of connection to open wire. Sectionalization has been provided for ease in trouble shooting and for transferring a portion of the cable to a second circuit.

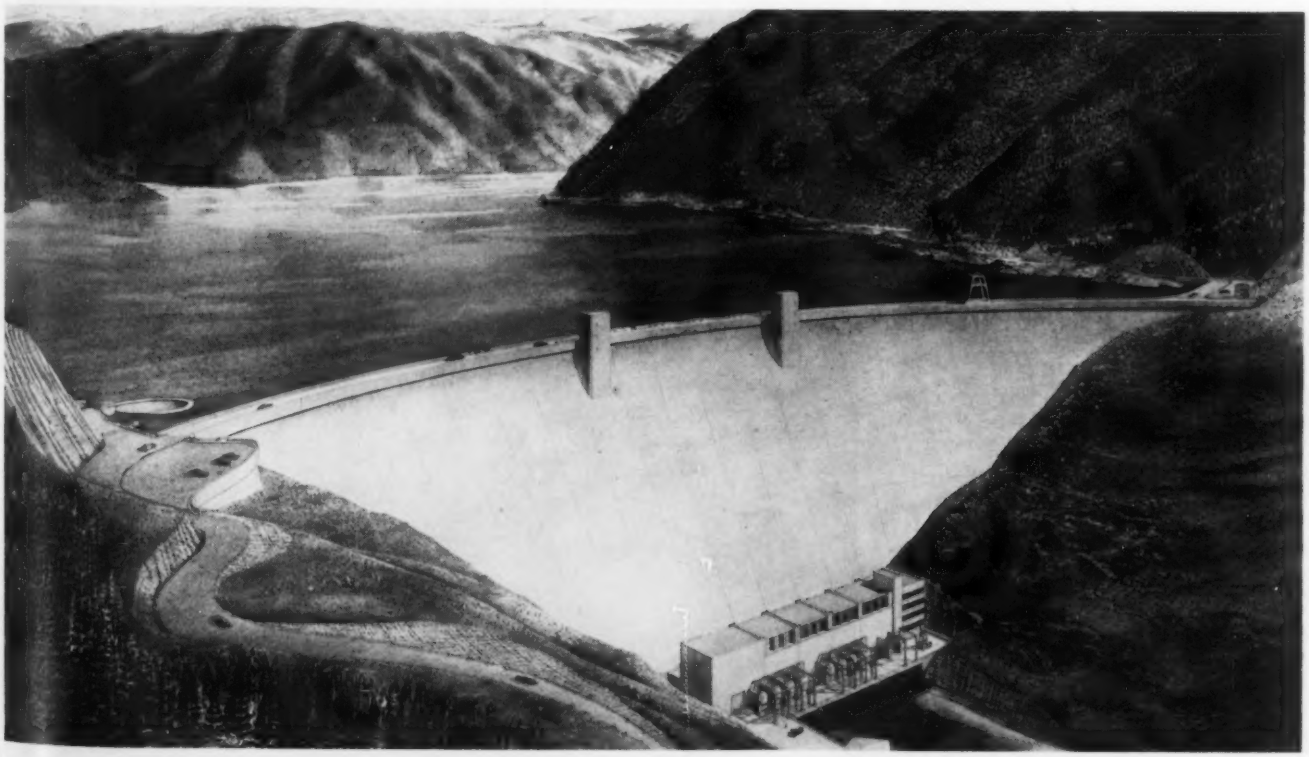
Cost data and operating experience from this installation will serve as a basis for determining the extent to which aerial cable will be used on the Edison system. Preliminary analysis has indicated that in this particular case savings in annual tree trimming costs alone will more than pay the annual carrying charges. Greater reliability is indicated by uninterrupted service during a recent storm, when the number and size of fallen limbs and bark probably would have resulted in several circuit interruptions and possibly one or more broken conductors on an open-wire circuit.

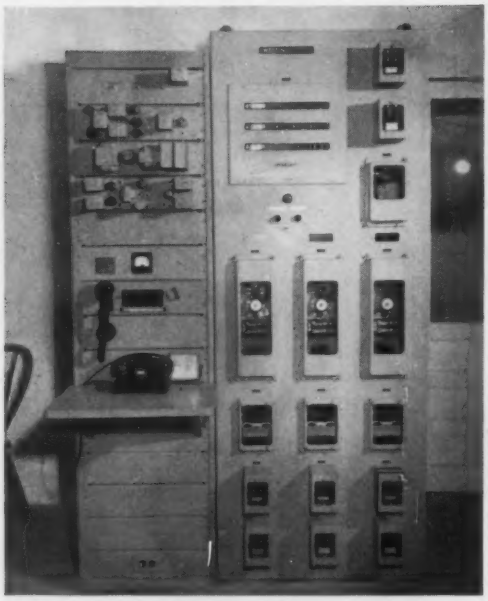
Part of the first installation of three-phase aerial cable on the Southern California Edison system is shown above. Some 7,600 ft. of non-shielded 5-kv. cable were installed on a 4-kv. circuit adjacent to eucalyptus trees near Oxnard, Calif. Lower is typical three-conductor tap from cable to open wire

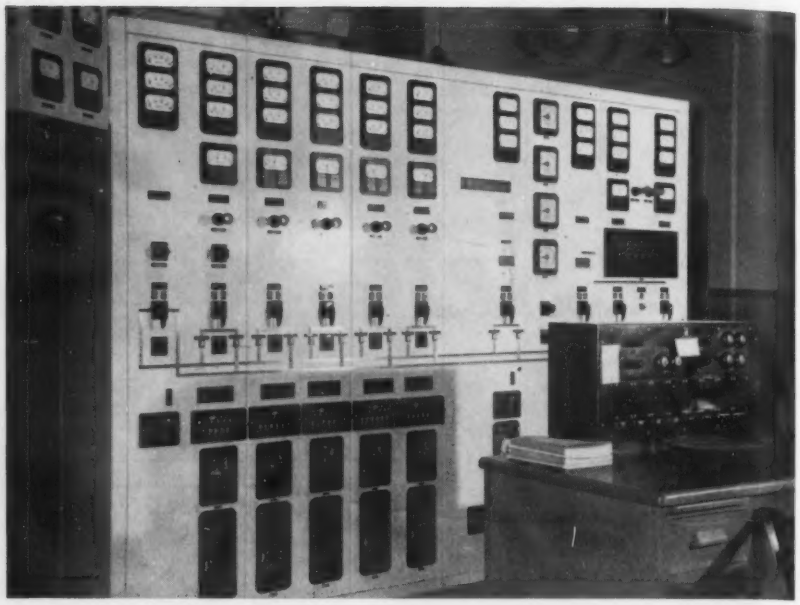


Configuration of 4-kv. circuit showing aerial cable and eucalyptus windbreak. Junction of three-phase cable, open line

With equipment bids in and some work already under way, Hungry Horse, 285,000-kw. USBR federal project moves a step further toward completion in 1952. Located on the South Fork of the Flathead River near Kalispell, Mont., on the headwaters of the Columbia River, Hungry Horse will be integrated with the Northwest Power Pool and existing plants on the Columbia. A 520-ft. dam impounding 3½ million acre-feet will give an effective head of 400 ft. for four 75,000-kva. units. Feature of the project will be a 53,-000-c.f.s. glory-hole-type spillway. Two 230-kv. lines will feed power into Northwest network for use throughout five-state area. Here is artist's conception of dam and power house







Automatic control of substations requiring some degree of selectivity in restoring service after an outage is incorporated in these typical switchboards. Included are the feature switches, reclosing control devices and annunciator

2,000,000-kva. System Goes Automatic

INCREASING size and complexity of present-day integrated network systems makes desirable greater speed and accuracy in performing switching operations than can be attained with manual operation. Based on years of satisfactory experience with automatic control of substations, Pacific Gas and Electric Co. is in the final stages of converting a major portion of important substations on its 2,000,000-kva. system to fully automatic operation. Included in the program, which will be completed in the San Joaquin Power Division of the company this fall, is a total of 80 substations large and small where some degree of selectivity must be exercised to restore service after line outages.

Flexibility in setting up control sequences based on system requirements at any given station is obtained through use of a group of four "feature" control switches on each breaker. Purpose of these switches is to operate the breaker as required for predetermined conditions at the station.

Breaker operation is required for four conditions, all indicated by potential transformers on each side of the breaker: (1) line energized, bus dead; (2) line and bus energized, but not necessarily in synchronism; (3) line dead, bus energized; (4) complete loss of power—line dead, bus dead.

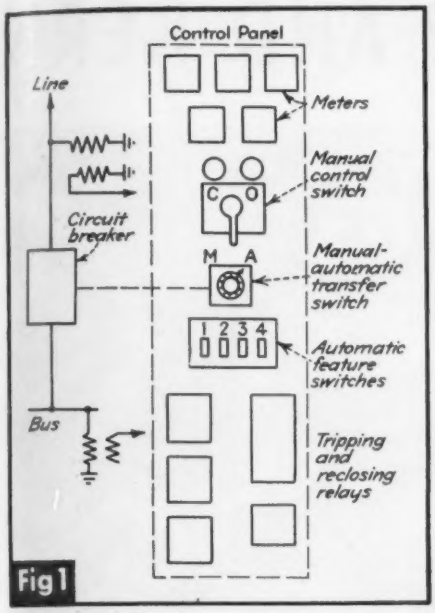
In conjunction with the proper tripping and reclosing relays the feature switches provide the following automatic operations required under the above conditions:

Feature switch 1 trips the breaker on power failure, first step in restoring service after a complete outage.

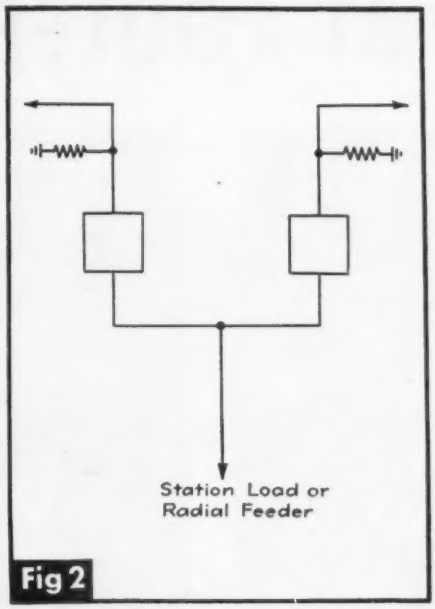
Feature switch 2 recloses if voltage appears on the line side, thus restoring power to the bus.

Feature switch 3 recloses if voltage

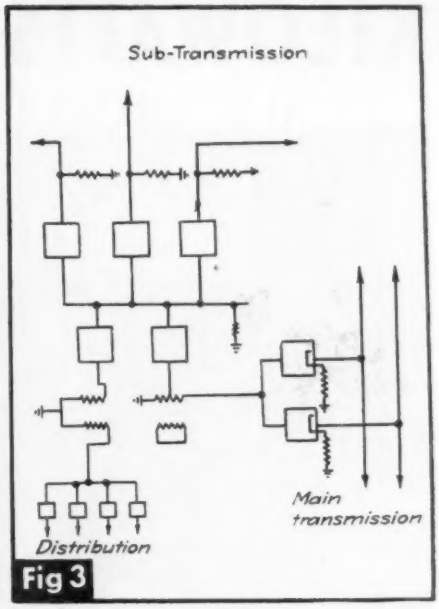
Typical of stations which make up the bulk of 80 now under automatic control on Pacific Gas and Electric's 2,000,000-kva. system is Coppermine, 3,000 kva.



General panel layout of units necessary for operation of oil circuit breaker



Simplest case of a loop substation or switching point with two power sources



Station with several sources and feeds with operation similar to East Nicolaus

is present on bus and line, thus re-paralleling station and line. Synchronism of bus and line must be checked unless fixed by system.

Feature switch 4 recloses to test the line if voltage on bus, none on line.

Flexibility in setting up preferred sources and other special local operating features is obtained through use in the reclosing relay circuits of voltage checking or interlocking control relays with the necessary cutout switches in their potential circuits. Thus any of the above features can be used or omitted as required. Circuit breaker control panel arrangement with the conventional manual control switch supplemented by a manual-automatic switch and the four feature switches is shown in Fig. 1

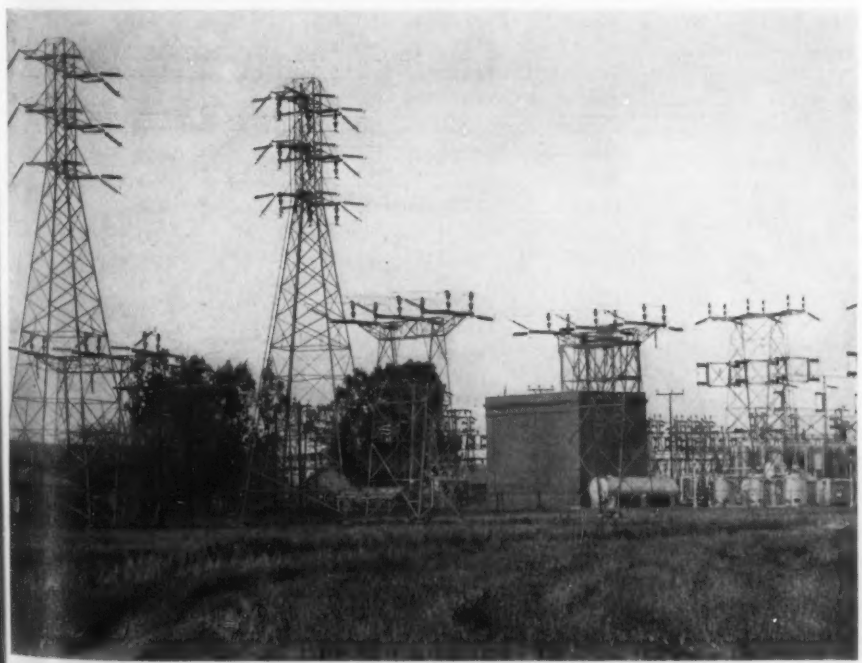
A simple loop substation supplied either from taps to two transmission lines or as part of a loop network is shown in Fig. 2. Normal operation may be from either or both of the lines, or with both breakers closed to maintain a through connection to adjacent stations on the loop. The feature switches can be set up to restore service after an outage with either as a preferred source, and to complete the loop or not, as desired. Changes in station operating orders are accomplished simply by resetting the feature switches, which if required frequently might be done by supervisory control.

Larger stations of the type shown in Fig. 3 with several incoming and outgoing circuits require only a simple extension of the same principals of operation applying to the two circuit station. Major difference is that it is not considered necessary to provide for tripping all lines on total power failure because of the remote possibility of simultaneous failure on all lines. In other respects the set-up of controls requires the same consideration of sequence desired in line testing and re-paralleling for each individual line.

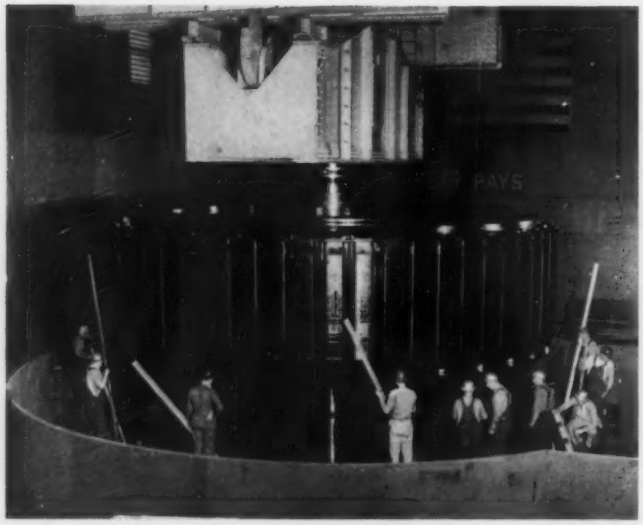
One very important auxiliary to satisfactory automatic control is a dependable alarm system. Remote indication of abnormalities in station operation is transmitted to the division switching center by two signals — "urgent" for conditions requiring immediate attention (breaker lockouts, control bus failure, etc.) and "ordinary" for such conditions as low output from station battery charger.

To insure the availability of well-trained competent maintenance men for this somewhat specialized equipment, P G and E has departed from its standard construction practice. Men installing, testing and putting the equipment in service are the same men who will be charged with future maintenance — an important factor in achieving the high dependability of this simple, modern system of control.

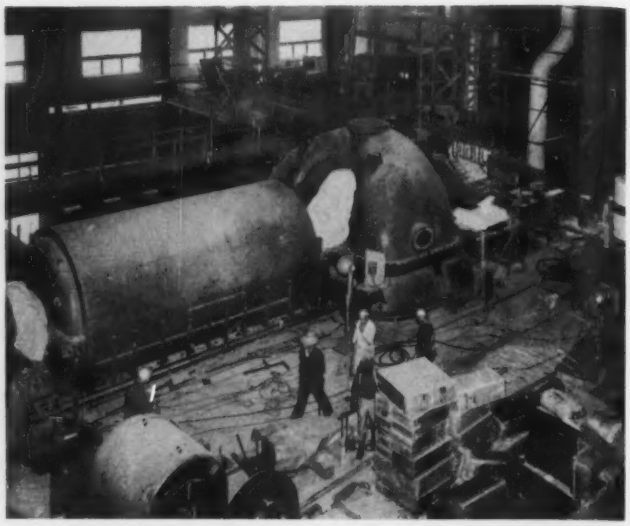
This 50,000-kva. substation with four 110-kv. and five 66-kva. lines at East Nicolaus is one of the major stations operated fully automatic and unattended



KILOWATTS AT COULEE AND KERN



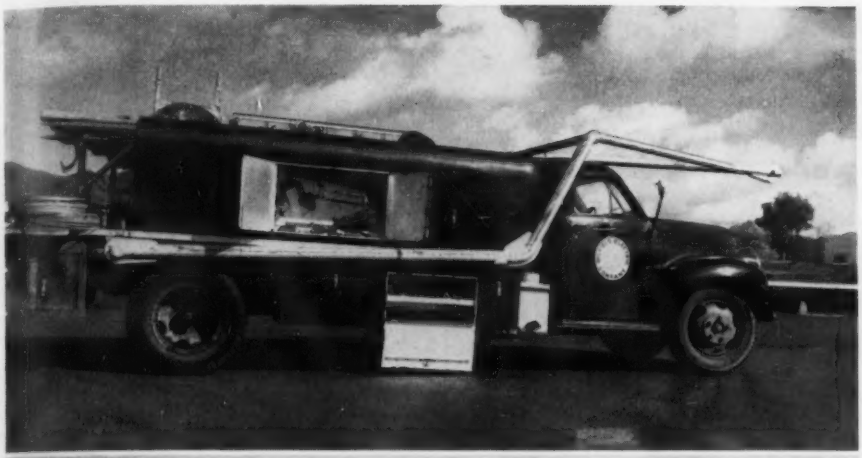
Installation of rotor in 108,000-kw. unit L-8, in service at Grand Coulee Feb. 12. Unit L-9 is scheduled for May



This 75,000-kw. unit at new Kern plant of Pacific Gas and Electric Co. was scheduled for operation by end of April

Calendar of New Generation

Date	Size	Plant	Agency
Feb. 12, 1948	108,000 kw. (H)	Grand Coulee	USBR
Feb. 23	66,000 kw. (S)	Redondo	So. Calif. Ed.
April 5	66,000 kw. (S)	Redondo	So. Calif. Ed.
April 15	75,000 kw. (H)	Shasta	USBR
April	100,000 hp. (S)	Kern	PG and E
April 28	35,000 kw. (H)	Big Creek 3	So. Calif. Ed.
April	5,000 kw. (H)	Grand Junction	Public Serv. of Colo.
May 1	50,000 kw. (S)	Silver Gate	San Diego G & E
May 1	7,200 kw. (H)	Malad	Idaho Power
May	108,000 kw. (H)	Grand Coulee	USBR
July	132,000 hp. (H)	Electra	PG and E
July	75,000 kw. (H)	Shasta	USBR
Sept.	35,000 kw. (S)	Lacombe	Public Serv. of Colo.
Oct. 1	13,500 kw. (H)	Malad	Idaho Power
Oct.	62,000 hp. (H)	Bridge River	B.C. Elec.
Nov.	149,000 hp. (S)	Sta P, S.F.	PG and E
Nov.	75,000 kw. (S)	Harbor	L. A. Dept. of W & P
Dec. 1	2-15,000 kw. (H)	Lower Salmon	Idaho Power
Dec.	21,000 hp. (H)	West Point	PG and E
Dec.	56,000 kw. (H)	Kerr	Montana Power Co.
Jan 1, 1949	20,000 kw. (S)	El Centro	Imperial Irrig. Dist.
Jan.	149,000 hp. (S)	Sta P, S.F.	PG and E
Jan.	44,000 kw. (S)	Pasadena	Pasadena L & P Dept.
Jan.	62,000 hp. (H)	Bridge River	B.C. Elec.
March	15,000 kw. (S)	Pueblo	So. Colo. Power
March	75,000 kw. (S)	Harbor	L. A. Dept. of W & P
June	75,000 kw. (H)	Shasta	USBR
June 1	11,500 kw. (D)	Tucson	Tucson GEL&P
July	40,000 hp. (H)	Colgate	PG and E
July	20,000 kw. (S)	Burbank	Burbank PS Dept.
July	3-75,000 kw. (H)	Keswick	USBR
Aug. 1	15,000 kw. (H)	Lower Salmon	Idaho Power
Sept. 1	15,000 kw. (H)	Lower Salmon	Idaho Power
Oct.	10,000 kw. (S)		Colo. Spr. PU Dept.
Oct.	2-66,000 kw. (S)	Redondo	So. Calif. Ed.
Oct.	27,000 kw. (H)	Umpqua	Cal. Ore. Power
Oct.	62,000 hp. (H)	Bridge River	B.C. Elec.
Nov.	50,000 kw. (H)	Ariel	Pacific P & L
Nov.	100,000 hp. (H)	Cresta	PG and E
Dec.	75,000 kw. (S)	Harbor	L. A. Dept W & P
Jan. 1, 1950	23,000 kw. (H)	Bliss	Idaho Power
Feb. 1	134,000 hp. (S)	Kern	PG and E
March 1	23,000 kw. (H)	Bliss	Idaho Power
May 1	23,000 kw. (H)	Bliss	Idaho Power
June	169,000 hp. (H)	Rock Creek	PG and E
Aug.	40,000 kw. (S)	Crem	Utah P & L
Oct. 1	50,000 kw. (S)	Silver Gate	San Diego G & E
Nov.	40,000 kw. (S)	Arapahoe	Public Serv. of Colo.
Nov.	40,000 kw. (S)	Honolulu	Hawaiian Elec.
Nov.	27,000 kw. (H)	Anderson Ranch	USBR
Jan. 1, 1951	10,000 kw. (H)	Drop 4, All-Am. Canal	Imperial Irrig. Dist.
May	150,000 hp. (S)	Undetd.	PG and E
June	150,000 hp. (S)	Undetd.	PG and E
Aug	150,000 hp. (S)	Undetd.	PG and E
Nov.	40,000 kw. (S)	Arapahoe	Public Serv. of Colo.
July, 1952	75,000 kw. (H)	Hungry Horse	USBR
	20,000 kw. (S)	Glendale	Glendale P S Dept.
	3-37,500 kw. (H)	Owens Gorge	L. A. Dept. W & P
Jan. 1953	75,000 kw. (H)	Hungry Horse	USBR
	60,000 kw. (S)	Undetd	L. A. Dept. W & P
Total	3,541,000 kw.		



NEW BOOM TRUCK SAVES MAN-HOURS

TO offset their increasing costs for contracting line construction and equipment installation, Oilfield Electric Co. of Ventura, Calif., developed and is using the new-type boom truck illustrated. Flexibility and ease of operation of the unit have effected substantial savings in man-hours and material handling costs in their contracting work.

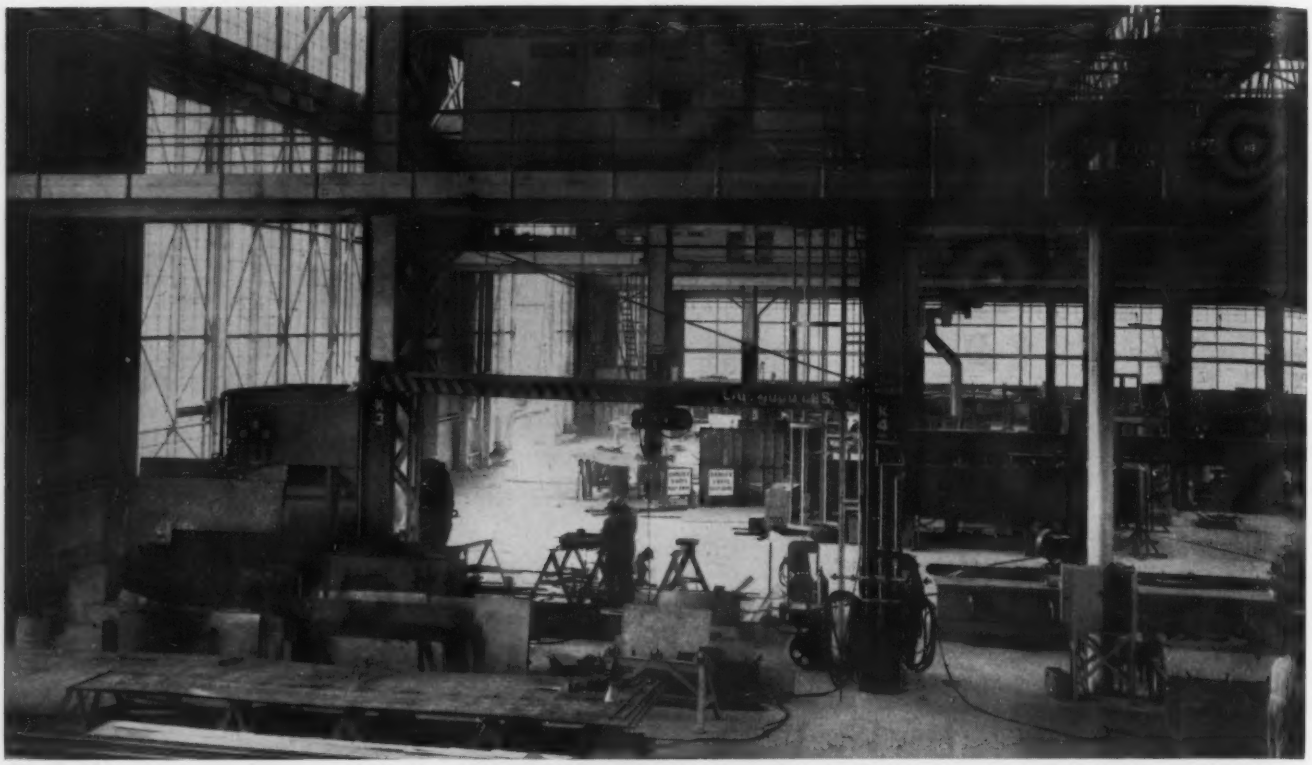
Original design by L. L. Eakin used a modified A-frame boom made of 4-in. and 3-in. oil-well pipe with a dog-leg which allowed the upper end to fit over the cab. The boom is raised and lowered in a vertical plane by hydraulic rams which rotate it through an arc of nearly 180°. Other operating component is a conventional winch also controlled from the cab of the truck. The 5-ton unit will carry full rated load out to an angle of 40°, and can pick up three tons in its lowest position. Since the boom can be locked in any position by closing the operating valve, and can be moved throughout its travel while loaded, loading and unloading the truck is easily accomplished by two men. A transformer, for instance, can be picked out of a group on the ground, carried over the bed of the truck and spotted in any desired location. Unloading is also simplified, since no shifting of unwanted material is necessary to get at the piece needed. Time required to load and unload has been cut to one-third of conventional methods.

Manufacturing rights for the design have been assigned to the Crescent Tool Co. of Long Beach, and units up to 15-ton capacity will be available.

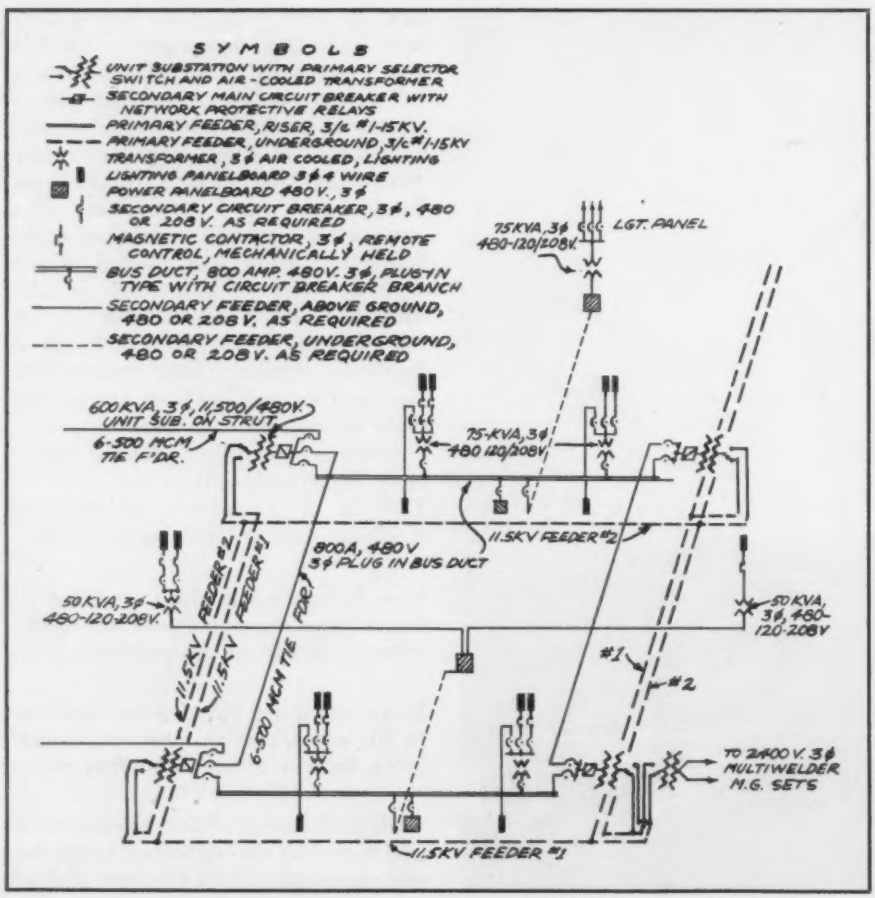
New hydraulic-operated, modified A-frame boom meets highway clearances, allows access to all cab and body doors

Boom can carry rated 5-ton load out to 40° angle, pick up maximum load of three tons in extreme position shown

With combination of conventional winch and hydraulic ram-operated boom two men can load, unload any part of truck



Subs Aloft Clear Main Deck for Action


SYMBOLS
UNIT SUBSTATION WITH PRIMARY SELECTOR SWITCH AND AIR-COOLED TRANSFORMER
SECONDARY MAIN CIRCUIT BREAKER WITH NETWORK PROTECTIVE RELAYS
PRIMARY FEEDER, RISER, 3/c #1-15KV.
PRIMARY FEEDER, UNDERGROUND, 3/c #1-15KV
TRANSFORMER, 3φ AIR COOLED, LIGHTING
LIGHTING PANELBOARD 3φ 4 WIRE
POWER PANELBOARD 480 V., 3φ
SECONDARY CIRCUIT BREAKER, 3φ, 480 OR 208 V. AS REQUIRED
MAGNETIC CONTACTOR, 3φ, REMOTE CONTROL, MECHANICALLY HELD
BUS DUCT, 800 AMP. 480 V. 3φ, PLUG-IN TYPE WITH CIRCUIT BREAKER BRANCH
SECONDARY FEEDER, ABOVE GROUND, 480 OR 208 V. AS REQUIRED
SECONDARY FEEDER, UNDERGROUND, 480 OR 208 V. AS REQUIRED
75 KVA, 3φ 480-120/208V.
LGT. PANEL
600 KVA, 3φ, 11,500/480V. UNIT SUB. ON STRUT
6-500 MCM TIE F'DR.
75-KVA, 3φ 480 120/208V
11.5KV FEEDER #2
800A, 480V 3φ PLUG IN BUS DUCT
50 KVA, 3φ 480-120-208V.
FEEDER #2
FEEDER #1
50 KVA, 3φ, 480-120-208V
11.5KV
11.5KV
6-500 MCM TIE
#1
#2
TO 2400 V. 3φ MULTIWELDER M.G. SETS
11.5KV FEEDER #1

POWER from a double primary loop with transformer secondaries interconnected, and location of major building service units on catwalks above the floor are two of the many advanced design features of the new Shipfitters and Boilermakers Shop at San Francisco Naval Shipyard.

Two underground feeders bring 11-kv. power to primary selector switches on four 600-kva. and one 750-kva. unit substations. Secondaries of the four 600-kva. transformers are connected in a 480-volt network through secondary main circuit breakers with network protecting relays. As shown in the accompanying one-line diagram, 800-amp. plug-in bus duct is used for two opposite sides of this network, providing power take-off at points along the connection.

Normal operation is with two opposite units on the same bus as indi-

Elevated unit substation in new Shipfitters and Boilermakers shop at San Francisco Naval Shipyard is one of four 11-kv., 600-kva. units on a double primary loop with secondaries interconnected. Other service equipment, such as blowers, welding generators and lighting transformers, was also located on catwalk to allow maximum floor space

Current for welding is supplied from four 2,000-amp., six 600-amp. constant potential welders, with return through I-beams bedded on 2-ft. 6-in. centers

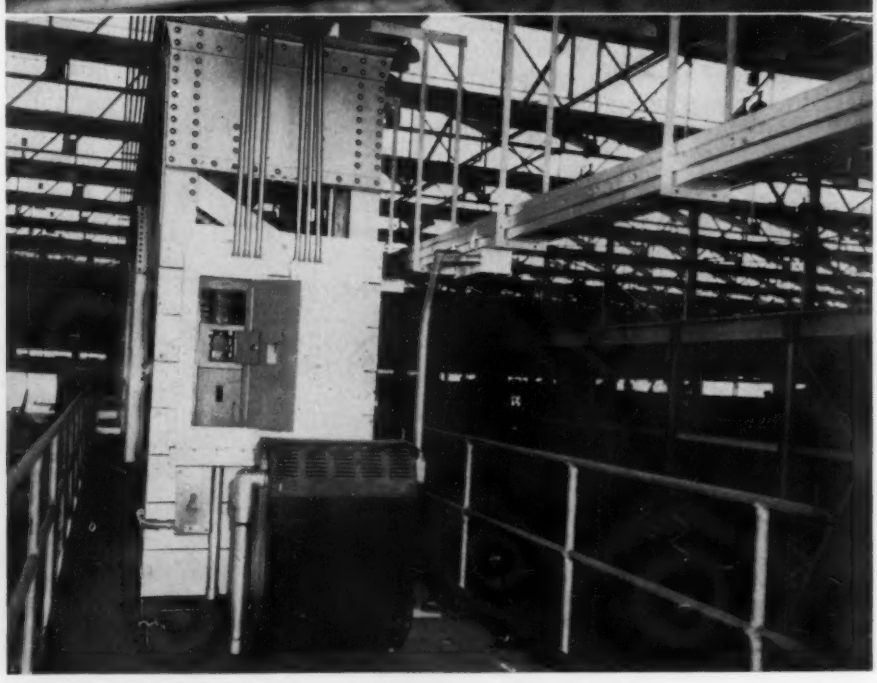
Welding panel carries leads from generator on catwalk to resistance boxes on right. Welder attaches stinger to box, selects proper resistance for work

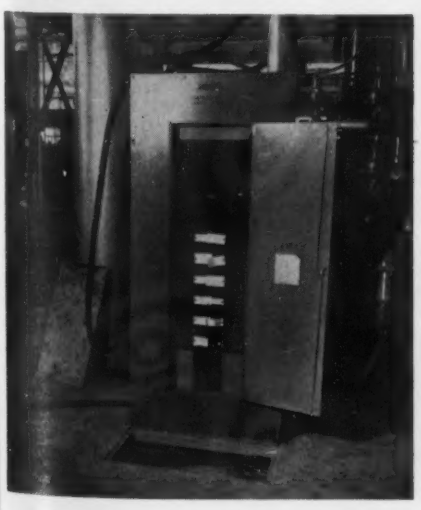
Lighting transformer and switch panel are located on catwalk. Preset combination of lighting in 16 zones is remotely controlled by floor-level switch

cated. In case of fault on either primary the two affected transformers are cut loose simultaneously by the network protectors to prevent feeding power from the other primary through the network back to the fault. Upon tripping, the breakers are locked out, and power must be restored from the faulted primary before they can be reclosed. Should the remaining two transformers be overloaded when they assume full load of the building, their temperature rise first signals an alarm, then if it continues to rise, removes them from service.

Power from the 750-kva. unit drives four 2,000-amp. and six 600-amp. constant potential multiwelder motor generator sets, also located on the catwalk 28 ft. above the floor. Output of the 2,000-amp. sets in parallel and the 600-amp. sets in parallel feeds 24 panels located at floor level throughout the welding area. Positive terminal is connected to a variable resistor box, where the welder connects his electrode and selects proper resistance for his job. Return path is provided by tack-welding the work to a common return grid system of I-beams imbed-

Floor mounting of power distribution panel eliminates conduit from panel to floor. Direct connection to machine is made via conductor in floor conduit





Robertson Q-floor duct was used in office spaces for floor, wiring raceways and telephone cables, tack-welded fixtures

Wide expanse of mold loft is maintained at 50 ft.-candles by 480/277-volt fluorescent mounted 23 ft. above the floor

ded in the floor on 2-ft. 6-in. centers. Added feature is an exhaust system with floor inlets for flexible metal hose on 20-ft. centers. Blowers for the system are also located on the catwalk and exhaust directly through the roof.

Power distribution from the 480-volt bus duct feeds down to floor-mounted panels as shown. Feeder circuits go directly from a flush pull box 8x12x6 in. deep through conduit to flush boxes in the floor for machine tools and other loads. By eliminating conduit from panel to floor this design effected a substantial reduction in man-hours required for installation. Construction of the extensive underground primary and secondary systems required more than 60,000 ft. of 4-in. fiberduct and 17 standard twin manholes with a high-voltage section and a communication section.

Total lighting load for the well-illuminated building is 840-kw., including exterior floodlighting. Combined mercury and incandescent units mounted 35 and 50 ft. above floor level maintain lighting in the main shop at 35 ft.-candles. Lighting transformers and panels operated by magnetic contactors are located on the catwalks. Remote control of these 120/208-volt panels by a 120-volt pilot circuit provides 16 zones of light which can be used in any required combination. Fluorescent units in the mold loft operate on 480/277 volts using insulating transformers to establish a neutral, and from a height of 23 ft. maintain a level of 50 ft.-candles. Office lighting, also fluorescent, is maintained at 40 ft.-candles. Robertson Q floor was used extensively in the building, not only for its flexibility as wiring raceway for telephone and lighting circuits in combined floor and ceiling, but also for the roof and lighting of the mold loft.

Building was designed by Albert Kahn Associated Architects and Engineers of Detroit and local offices of A. W. Earl. General contractor was J. I. Barnes of San Francisco and Los Angeles, and the extensive electrical work was done by Abbett Electric Co., Bay Area contractor. Coordination with the Navy was through Capt. W. T. Eckberg, S. S. Gorman, project engineer, and J. H. Klebanoff, electrical engineer.

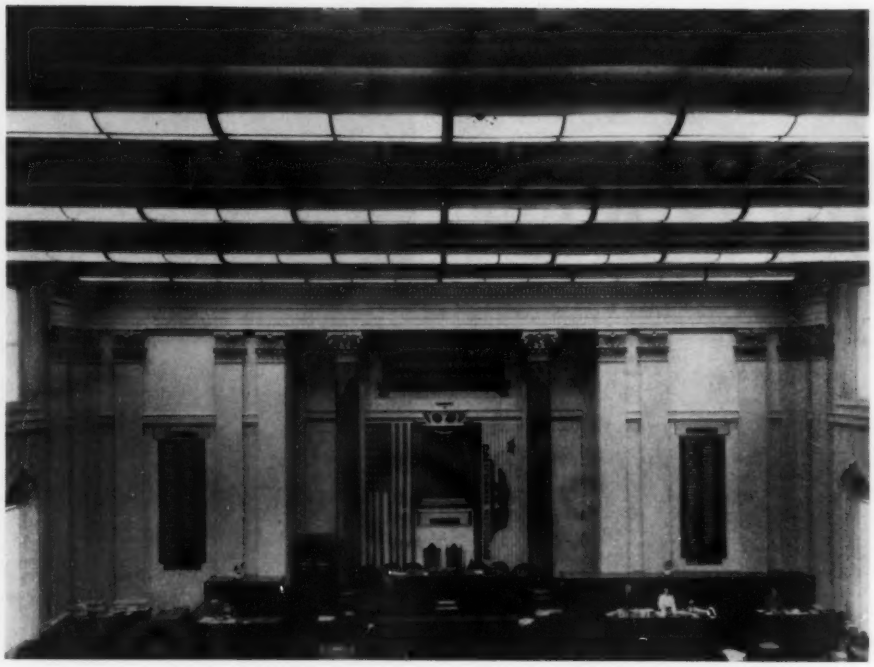
● An Ordinance has been submitted to the Fresno City Commissioners to extend the scope of the electrical ordinance in order to cover low-voltage controls of 6 volts and over, designed for controlling lights, inductive or non-inductive loads. The ordinance was brought about by the need to clarify installation regulations for the push-button type of wiring for control of lighting which has come out recently. It requires that relays be installed in 4-in. outlet boxes, be readily removable for exchange, that low-voltage wiring be separated by approved barriers, that low-voltage wiring shall not be less than No. 18 gage rubber covered with 300-volt insulation and that it be run in workmanlike manner. It prohibits running across ceiling joists or floor joists but requires it must pass through bored holes and be secured to the side of joists, studs or rafters with insulated staples. Each transformer is to be protected with overcurrent protection on the secondary side not exceeding its capacity. Switches are also to be installed in boxes and all metallic boxes must be grounded.

● Policy—To clarify a highly-charged situation where there is an undercurrent of pressures, criticism and controversy on the subject of ordinances the Pacific Coast Electrical Association Code and Ordinance Committee has issued a Statement of Policy setting forth frankly and clearly the purpose of its work and its attitude toward undue restrictions and lack of uniformity. Says managing director Victor Hartley, "We hope this Statement of Policy may indicate the channel in which we all have a common interest so that we can prevent the controversies that have had such destructive effects elsewhere."

● J. Lloyd Kamm, illuminating engineer of Spokane, Wash., has just published a book, *Lighting To Stimulate People*, in which he explores the psychological reactions derived from various types of lighting environment. It presents a different approach to lighting design.

HIGH-BAY fluorescent lighting on the 34-ft. ceiling of the legislative assembly room in the state capitol building at Sacramento, Calif., made possible by specially designed fixtures for directing the light downward and Thompson hangers to solve the maintenance problem, is one of the most outstanding recent West Coast lighting jobs. The installation comprises six rows of fixtures. The center four consist of semi-circular fixtures, end-to-end, each containing four sets of three-tube type F 40-watt lamps making 12 tubes per section. First and last rows are half sections of these. Holophane curved prismatic Controlens are most effective in directing the light downward to give 50-60 foot-candles at desk-top level.

A high-ceiling installation of this type was made possible only by some provision for maintenance. Use of Thompson hangers solved this problem. Entire 12-tube sections of the heavy

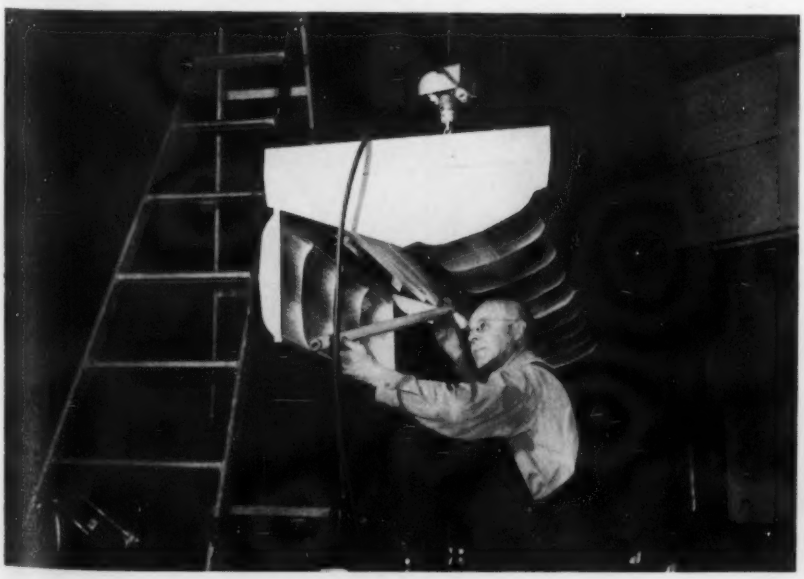


High-Bay Fluorescent—Capitol Idea

fixtures are lowered to the floor by use of the double-drum hand winch shown. Control and positioning of fixtures is handled by telephone between a man at the winch and the man on the floor of the room below. Bissett Electric Co., contractor of Sacramento who did the job, provided the portable receptacle shown for energizing the unit for test when lowered. Fixtures with Holophane Controlens were supplied by Hub Electric Co. Hangers were furnished by Thompson Electric Co.

Old lighting displaced consisted of 12 immense incandescent chandeliers, nine with 5 kw. each, and three with 250 watts each. Light was poor and the heating problem always had been a source of trouble. Old fixtures were unsightly and incongruous besides doing a poor lighting job. The new fluorescent installation harmonizes beautifully with the architecture of the historic room and is a fine example of providing a modern facility that matches or does not clash with old architecture.

Maintenance problem was solved by use of Thompson hangers permitting units to be lowered for tube replacement. Portable hand winch lowers fixtures for maintenance. Control and positioning are handled easily by telephone



Spokane Modernizes with Mercury

Albert Gruber
Washington Water Power Co.

Downtown street in Spokane before new mercury lighting system was installed. Old low-standard magnetite arcs were replaced in three steps described below

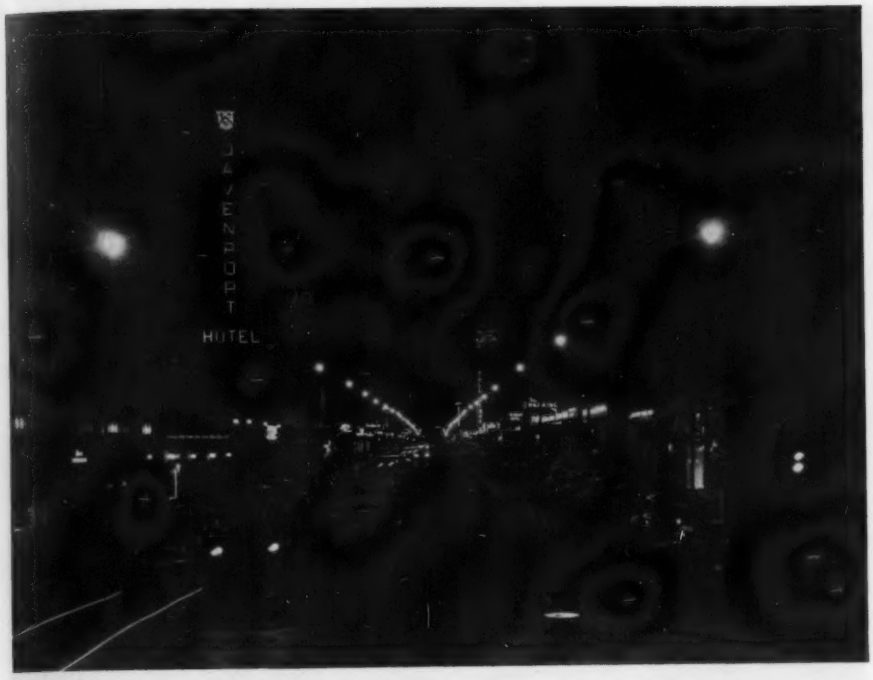
SPOKANE has under way what is probably the country's largest business district street lighting modernization program. Mercury is replacing magnetite arcs on 550 standards. Of these, 437 will be pendent-type luminaires, asymmetrical light distribution, long globe (alabaster); equipped with General Electric 16,000-lumen, FH 1, mercury-vapor lamps. On Riverside Ave. only, there will be 113 horizontal-type luminaires, asymmetrical light distribution, reflecting lens globes with Westinghouse 20,000-lumen, EH 1, lamps. Existing bases are being utilized to mount 22-ft. octoflute extensions equipped with 4-ft. upsweep mast arms. Old standards now being replaced were only 13½ ft. high.

One of the interesting aspects of the job is the method used by the Washington Water Power Co. in making the changeover from d-c arcs to a-c mercury without interrupting lighting service. The three steps in the process are shown by the accompanying diagrams. Mechanical steps required to modern-

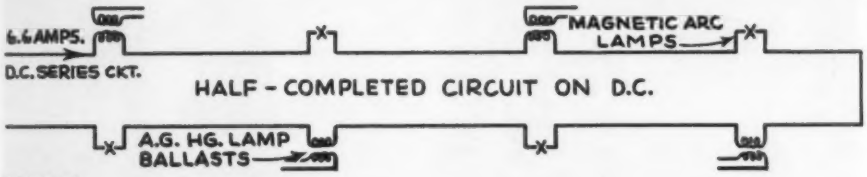
Old bases were used by reaming out anchor rod holes for larger anchor rods. Portable air-driven motor and ship reamer saved labor on each of posts

Bolting middle section of new standard into base. New standards which came in parts were bolted together to complete the installation on the old base

Final step in erection of new lights was hanging the luminaire completely assembled on mast arm. Cut-over made without interrupting lighting service

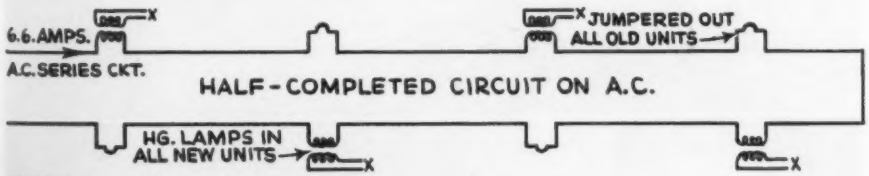


Night view after installation of 20,000-lumen units on same street. Total installation of 437 16,000-lumen and 113 20,000-lumen units is largest on Coast



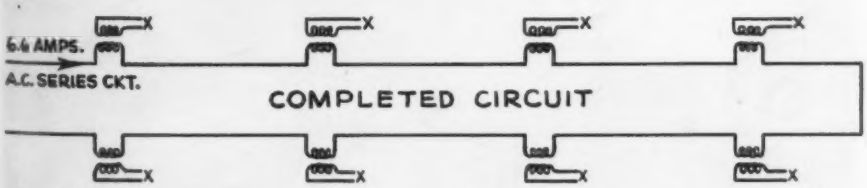
STEP I*:

Remove half of the magnetite arc units and in their place install the control transformers and the mercury-vapor units complete without the lamps. Continue to operate the circuit at 6.6 amp. direct current.



STEP II:

Jumper the arc mechanism and discontinue operation of the remaining magnetite arc units. Change the supply circuit to 6.6 amp. alternating current. Install the mercury-vapor lamps and operate the modernized portion of the circuit.



STEP III:

Replace the remaining magnetite arc units with control transformers and mercury-vapor units complete with lamps.

*NOTE: Be sure ample switching capacity is available for opening the direct-current circuit after the control tranformers are connected in the circuit. Switching must be suitable to handle the "inductive kick" from the circuit.

ize each standard are accomplished in the following sequence

1. Completely dismantle old 13½-ft. lighting standard and magnetite-arc control mechanism.
2. Replace the existing ⅝-in. diameter anchor rods with 1-in. rods.
3. Ream the anchor rod holes in the existing base from ¾-in. to 1⅛-in. diameter.
4. Reset and level the ornamental base and install the IL transformer.
5. Assemble the luminaire, secondary circuit, glassware and mercury lamp on the 22-ft. extension shaft.
6. Install the complete extension shaft assembly on the reset ornamental base.
7. Change circuit from d-c to a-c and connect secondary lamp circuit to control transformer.

Twenty-two man-hours are required per unit modernized.

The ornamental street lighting system in the downtown area of Spokane is owned by the city. Modernization and operating costs are borne jointly by the city and by lighting improvement districts. Property in these districts is assessed an annual amount based upon number of units and owner's footage. The city pays 25% of lighting costs for the district, while the property owner pays 75%. Contracts are usually for ten-year periods.

The Washington Water Power Co. contracts with the city for operation and maintenance of lights in these districts. In cases of new installations or modernization of existing equipment in the districts, the company has contracted to finance the installation and amortize the costs over a ten-year period. Payments to the company are based upon three elements: (1) energy at 6 mills per kwh.; (2) attendance, lamp renewal and maintenance; (3) amortization of the investment for modernization of the equipment. Present contract rate during the amortization period is: $60 per year for the 16,000-lumen mercury-vapor unit and $70 for the 20,000-lumen unit.

This method of installation, financing, operation and ownership applies only in the downtown area of Spokane. All other street lighting is installed, owned and operated by the power company and the city pays on a regularly filed schedule. In this a flat monthly charge is made for each lamp based upon lumen output; energy at 6 mills, lamp renewal and attendance, and fixed charges on the investment.

Spokane's new lighting system will be by far the largest mercury lighting installation on the West Coast. A number of smaller jobs have gone in but this is the first major modernization with new high-intensity mercury lights.

Back In the Range Business

ELECTRICAL contractors have an opportunity to get back into the range business with a new two-unit type designed to be built into the kitchen. First installations are proving satisfactory all around—to the architect who can now plan the completely integrated kitchen; to the aforementioned contractor who not only handles the range, but can plan the over-all installation more efficiently, and, most important, to the home owner who enjoys a personalized custom-built job at conventional range prices.

Typical of installations using this Thermador built-in range is a housing project in Pomona, Calif., where electrical contractor Vic Bongberg is installing one in every one of the 126 homes being built. Since the installation becomes a permanent part of the house, it can be financed on the original loan or mortgage, in this case for an increase in payments of only 75 cents per month.

The range comes in two parts. One is a cooking top with three single-coil, tilt-to-clean units and a five-quart deep-well cooker, all mounted on a stainless steel rectangular base with semi-flush controls front and center. This unit fits into a rough-in box approximately 44x16x11 in. deep with openings for two drip pans. Second part is a completely self-contained and insulated oven mounting an automatic timer clock, minute minder and oven control, and fitting into an opening 20x24x24 in. deep. These independent units may be mounted on the working level at any height to suit the housewife, and may be located any place desired, even on opposite sides of the working area or kitchen. This flexibility in height and location of the units is obtained without need for special mounting or wiring, making installations uniform, and therefore easier for the contractor.

Stainless steel cooking top of two-unit range fits in this 44x16x11 rough-in box

Completely independent oven can be on other side of kitchen, at any height

Separate cooking top, oven, offer flexibility in new Thermador Bilt-In range

PANORAMA OF THE PCEA

Edited by A. X. Schilling

Convention Plans

"We Accept The Challenge."

With that topic, president H. H. "Kelly" Courtright will officially open PCEA's 1948 convention at 10:30 on the morning of June 16. The opening session, like the other morning general assemblies, will be held at the Fairmont Hotel, San Francisco, this year's convention headquarters.

Following Courtright's opening message, D. D. Smalley, vice-president in charge of operations, PG and E, will discuss *Our Responsibilities And What We Are Doing to Meet Them.* The opening day's luncheon, scheduled for the Fairmont's Terrace Room, will feature Dr. John O. Moseley, president of the University of Nevada, Reno, who will speak on *The Intangibles of Leadership.*

The general assembly on June 17 will open at 9 a.m., with Dr. Adam S. Bennion, vice-president of the Utah Power and Light Co., Salt Lake City, speaking on the subject, *Getting Along With Our Own People.* Second speaker will be Dr. Chilton R. Bush, dean of the school of journalism, Stanford, who will discuss the problem of *Getting Along With Our Public,* and Dr. Dwight Palmer, consulting research engineer, Los Angeles, will round out the morning's session with a talk on *Industry Marches Westward.*

The luncheon meeting on June 17 will feature Dr. Algerdas N. Cheleden, Los Angeles attorney, whose topic will be *Which Way, America?*

The final day's general session will also open at 9 a.m. and will feature a talk by R. G. Folsom, professor of mechanical engineering, University of California, Berkeley, on the subject *Pacific Southwest Water Supply,* and a discussion by Thomas M. Robins, brig. gen., USA, ret., consulting engineer, Portland, Ore., whose subject will be *A Rational Basis For Federal Power Development.*

The session will be concluded with the association's annual meeting.

Under the auspices of the Operating Economics Section, these groups will meet in parallel sessions during the afternoons: steam generation, hydrogeneration, substation, meter, transportation, transmission and distribution, and communications.

Similarly, these groups of the Administrative Services Section will conduct meetings: purchasing and stores, accounting, credits and collections. The personnel and customer relations groups will hold joint sessions.

The Business Development Section will meet as a unit to discuss the impact of frozen foods on the electrical industry; important developments ahead; industrial developments ahead; national rural electrification; electrical modernization of commercial buildings; merchandising with light; television and home economics.

No formal meetings are being planned for the afternoon or evening of the final day, June 18, which will be devoted to the annual golf tournament, cocktail party, banquet and dance.

O. R. Doerr, PG and E, San Francisco, has been appointed general convention chairman. He will be assisted by committees headed by the following: program, George C. Tenney, McGraw-Hill Publishing Co., San Francisco; stage, William Hynes, PG and E, San Francisco; attendance, R. R. Walbridge, Southern California Edison Co., chairman, and D. D. Smalley, PG and E, San Francisco, vice-chairman; banquet, C. W. Goodwin Jr., G-E Supply Corp., San Francisco; cocktail party, Herbert G. Atwater, Leo J. Meyberg Co, San Francisco; golf, R. G. Holabird, National Electric Products Corp., San Francisco; hotel, Harry A. Lee, PG and E, San Francisco; ladies' entertainment, Frank E. Bodine, Westinghouse Electric Corp., San Francisco; publicity, A. X. Schilling, Southern California Edison Co., Los Angeles, chairman, and C. P. Johnson, Westinghouse Electric Corp., San Francisco and F. Lowell Garrison, G-E Supply, San Francisco, vice-chairmen; reception, H. F. Hartzell, Maydwell & Hartzell, Inc., San Francisco; registration, M. S. Barnes, General Electric Co., San Francisco; transportation, J. S. Moulton, PG and E, San Francisco; and ushers, J. S. C. Ross, PG and E, San Francisco.

While the convention headquarters will be the Fairmont Hotel, some meetings will be scheduled in the Mark Hopkins Hotel. Registrations will be made at the Fairmont, starting during the evening of June 15. Whenever possible, delegates are urged to register during the evening before the convention opens, in order to facilitate the registration of delegates who do not arrive until the morning of the sixteenth. Advance estimates are that about 1,000 persons will attend this year's convention.

S. F. Workshop

The association's first home economics workshop, entitled "Western Parade of Demonstration Ideas," which was held in Los Angeles on Feb. 19 and 20, proved to be so successful that the home economics committee plans to conduct a similar session in San Francisco on May 19 and 20.

The San Francisco session will be held in the new Westinghouse Electric Supply Co. auditorium at 201 Potrero Avenue, which has been made available for this purpose through the cooperation of R. S. Sloan, Westinghouse Supply Co. district appliance manager.

The enthusiastic participation by dealer organizations during the Los Angeles session makes it likely that home economists will be invited to attend from dealer establishments in San Jose, Stockton and Sacramento, as well as from those in the Bay area.

As was the case in Los Angeles, the San Francisco workshop will be designed to provide a refresher and training course for home economists, with instruction provided by specialists in food preparation, quick freezing, home laundering and related topics.

Marguerite Fenner, PG and E, director of home economics and chairman of PCEA's home economics committee, will conduct the workshop.

More New Things Not Yet

A SHADOW was cast over the four consecutive annual meetings of chapters of the International Association of Electrical Inspectors—in Denver, March 25-26; Salt Lake City, March 29-30; Pocatello, March 31; and Great Falls, April 2-3—by the absence of Victor H. Tousley, secretary-treasurer, IAEI, Chicago. Guiding spirit in the original amalgamation of regional groups of inspectors into the IAEI and its secretary - treasurer through 20 years, Tousley had announced he would retire this year. Before he could do so he suffered a stroke and, although reported well on the road to recovery, the illness caused his resignation and absence from this perennial series of meetings.

His companion in attending such meetings for years, James Steel Mahan, Chicago products consultant, came as far as Salt Lake City and himself suffered a stroke, Mahan, a former inspector, has long been chairman of the IAEI membership committee.

Without Victor Tousley's accurate knowledge of the National Electrical Code and his usual discussion of changes proposed to it, local committees bravely tackled programs without much code discussion. Well attended meetings heard a good deal about new electrical products and systems instead. In Denver, Rocky Mountain Chapter secretary, Victor Moulton, Mountain States Inspection Bureau, carried the code discussion. William L. Gaffney, secretary, Northwestern Section, chief electrical inspector of Tacoma, handled code changes and a review of association status in Tousley's place, at the other three chapter meetings.

Speakers in some cases addressed more than one of the series of meetings, in other cases only a single meeting. Fort H. Moore, secretary, Western Section, of Indianapolis, spoke to the Denver meeting about the annual meeting of the section in Denver, Sept. 13-15. T. J. Vieau, Crouse - Hinds Co., Denver, made a strong plea for genuine enforcement of code requirements for hazardous locations, citing in particular dangers from explosions of anaesthetic gasses in hospital operating rooms.

Space in this issue does not permit detailed reports of each talk or meeting, some of the salient questions of which may be reviewed in later numbers or explored in separate articles. Such subjects, bordering on the controversial in many cases, include: public condemnation of "restrictive" building codes (including electrical); grounding to copper water piping; is a house using liquid petroleum gas a

Pictures taken as the IAEI met last month in four consecutive annual meetings. Inspector personalities around the page, from top down and across: Vic Moulton, secretary, and Harvey Christensen, chairman, Rocky Mountain Chapter, at Denver meeting. . P. Hall, Ft. Morgan, new chairman, and R. H. Christensen, inspector, Rapid City. Utah officers Clarence Grant, chairman, D. J. Wolters, secretary, while Howard Price, IEA president, greets the group. New officers elected to Utah Chapter: John Christensen, first vice-chairman; T. E. Myers, Ogden, new chairman; John Fisher, Provo, second vice-chairman and Laurence Baty, secretary. In pictures below, Vernon Sharp, contractor, explains Touchplate and Safelex relay systems; Harrison Davin, demonstrates Fusetron circuit and motor protection; both at the Salt Lake City meeting

in the Code Discussed

"hazardous location" requiring explosion-proof wiring?; grounding plugs and receptacles for portable appliances; wiring in prefabricated houses that meets code requirements but not local codes; armored cable suffers from poor workmanship—how much of it is sabotage; is No. 8 wire big enough for modern higher wattage electric ranges?; should low-voltage lighting control systems be required to have more stringent installation rules than present code rules for signal and bell wiring?; is there a thermoplastic wire suitable for use in presence of oil and gasoline?; identification of the "high" or "wild" leg of a three-phase circuit; whether limits are necessary for outlets on a circuit protected by nontamperable fuses or circuit breakers; emergency lighting provisions in the code; wiring methods for panel heating by electricity.

The Utah Chapter meeting, presided over by Clarence Grant, Utah Power & Light Co., was addressed by Howard Price, president, and Carlos Stone, manager, of Intermountain Electrical Assn., who told of a uniform code just prepared with inspector help for recommendation to all Utah cities. D. J. Wolters, Salt Lake City chief inspector and chapter secretary, urged state inspection at the dinner meeting, also addressed by Mayor Glade and Gus Bachman of the Chamber of Commerce. Gordon Weggeland, FHA director, plead for low-cost houses from private industry rather than government housing. A V. Bronson, General Electric Supply, told why inspected installations are better for suppliers as well as the public in avoiding substitutions and cheapening of quality. Amos Jackson, Westinghouse Supply, presented an excellent adequate wiring talk and demonstration, at Salt Lake City and Pocatello.

Low-voltage wiring and relay control was explained at this meeting by J. Vernon Sharp, electrical contractor. He outlined the wiring of both the Touchplate and the Safelex systems and demonstrated equipment. Later, L. B. Johnson, General Eleectric Co., announced a new G-E low-voltage relay for such installations. Johnson also presented the subject at the Pocatello meeting; W. A. Lewis Jr., of Square D, Seattle, did so at the Great Falls meeting.

H. G. Ufer, Western superintendent, Underwriters' Laboratories Inc., Los Angeles, described testing procedure for explosion-proof equipment, both for the Utah and Montana chapters. L. John Christensen, West High School, reviewed the history of ground-

From top of page down: Secretary Dea Board, Afton-Lemp Electric, Boise, at Idaho Chapter. Carl Baldridge, state inspector, acting chairman. Next, Amos Jackson, Westinghouse Supply, Salt Lake City, demonstrating adequate wiring. Next, the Montana Chapter meeting—Jim Clune, secretary, Ralph Grant, Havre inspector, chairman, and Lou Herman, Westinghouse Supply, Butte, discussing Article 100. Then, Len Reagan, Montana Power, and two Seattle speakers, Douglas Donohue, Trumbull Electric Mfg. Co., on circuit breakers, and W. A. Lewis Jr., Square D, the Safelex system. Below, left, some of Idaho Chapter's new officers, R. C. Young, Boise; Carl Baldridge, Hy Hansen, Idaho Falls, new chairman; A. E. Dickey, Twin Falls, and A. A. Girard, Pocatello. At right, Montana meeting addressed by arrangements chairman John Larimer

ing in the code, attributing elimination of high-voltage accidental grounds in secondaries to grounding and urging the grounding of portable appliances, lamps, etc. Mahan, at Denver, announced that a new grounding plug and receptacle had been submitted to NEMA for possible standardization. Harrison Davin, Bussmann Mfg. Co., Denver, demonstrated behavior of Fusetrons under overload, starting current, locked rotor and dead-short conditions, both on single- and three-phase motors. He gave the demonstration also at Great Falls.

Workings of the Idaho State Electrical Code after one year since its enactment was the major topic at the one-day Idaho Chapter meeting in Pocatello. In the absence of Clyde Hicks, chapter chairman, Nampa, J. Carl Baldridge, state electrical inspector, presided. He reported the board's approval of a limited staff of inspectors, the engaging of one already, a new inspection tag which will be employed by contractors. All private and municipal power suppliers in the state had agreed to support the state inspection and require tags before connecting. Jurisdiction of state licensing over city licensing, under a ruling by the attorney general, brought a move for the appointment of a special committee to clarify this question if necessary by amendments to the state law.

Uniform examinations for wiremen and contractors in all districts, uniform ordinances in cities, joint hiring of an inspector by a group of neighboring towns, were also advocated. Baldridge declared himself firmly opposed to any "high wall" around a city or state to use legislation to limit competition instead of protect life and property.

Memories of an unsurpassed annual Northwestern Section meeting at Great Falls in 1940 left the Montana Chapter, chartered at that convention, with the problem of living up to its reputation for hospitality in 1949 when the section is scheduled again to meet in the state. But Great Falls turned over to its sister city, Butte, that pleasant opportunity next year. Earl Hoff, Graybar, was named chairman of a convention committee by Montana Chapter Chairman R. R. Grant, city electrician, Havre.

"Let's Not Get The Public Mad At Us," W. A. Cyr, associate editor, ELECTRICAL WEST, urged inspectors, as he had each of the previous meetings in the series. Use of the National Electrical Code with as little change as possible would enable inspectors to face public criticism of codes and justify needed regulation as national standards. Charles Jackson, loan division, REA, explained how REA selects inspectors for its borrowers. Douglas Donohue, Trumbull Electrical Mfg. Co., Seattle, described multi- and circuit breakers, their history, construction, economy and two main classifications. Cecil Kirk, electrical engineer, Montana Power Co., explained the need for and ways to provide clearances of service conductors above low-roofed houses. John Cromer, commercial engineer, Montana Power, told of radiant and reverse-cycle heating and their inapplicability in climates like those in Montana. He then reviewed the principles of adequate wiring.

Ed Lacy, Westinghouse, swiftly covered new electrical development in all fields. Lou Herman, Westinghouse Electric Supply, reviewed Article 100 and discussed it. Charles Smith, Cascade Electric Co., Great Falls, discussing Article 300, frankly admitted many deviations from the code for "practical" reasons. R. J. Larrabee, field engineer, Underwriters' Laboratories Inc., Seattle, past president of the section, reviewed the history of Laboratories' field work and testing in the West in order to inform all of facilities and services available to Western manufacturers. He also urged participation in Electrical Safety Week initiated by Capt. Sanislo, of Seattle, the Northwestern Section and Seattle Electric Club.

As in previous years the meeting ended with a general sentiment wishing for a state electrical law in Montana, and Grant appointed Frank Wise, Dillon, Montana, chairman of a committee to work on it.

New officers were elected at the close of each meeting, as follows:

Although Robert Thompson, New Mexico state electrical inspector, had been first vice-chairman of the Rocky Mountain Chapter he was not elected chairman at the concluding session, because New Mexico is attempting to organize a new chapter in which Thompson will be prominent. Instead, A. P. Hall, city inspector, Fort Morgan, Colo., was made chairman; R. K. Foulk, Home Gas & Electric Co., Greeley, first vice-chairman; Carl E. Simon, inspector, Bureau of Reclamation, second vice-chairman. On the executive committee, Harvey Christensen, Rapid City, past chairman, was named, and with him E. P. Hodges, Public Service Co. of Colorado, Denver; V. D. Markham, Colorado Springs inspector; T. P. Treadwell, Fort Collins fire chief; A. F. Schliter, Denver inspector, William Quandt, Southern Colorado Power Co., Pueblo; Austin Dunham, Anaconda Wire & Cable Co.; Kenneth B. Schumann, manufacturers' agent, Denver; Ralph Johnson, electrical contractor, Denver.

For the Utah Chapter, T. W. Meyers, Ogden city electrical inspector, was named chairman; L. J. Christensen, first vice-chairman; John Fisher, Provo city electrical inspector, second vice-chairman; Laurence Baty, Utah Tax Commission, secretary-treasurer. J. Hyde Stayner, Utah Power & Light, past president of the Northwestern Section and D. J. Wolters, Salt Lake City chief inspector, a vice-president of the section, head committees preparing to have the 1948 annual meeting in Utah. Because of hotel and convention conflicts in Salt Lake City, the annual meeting, Sept. 20-22, will probably be held at Hotel Ben Lomond, Ogden.

Idaho Chapter elected Hy C. Hansen, Idaho Falls electrical inspector, its chairman; J. Carl Baldridge, secretary-treasurer; and for district vice-chairmen—A. A. Girard, Pocatello city fire chief, Southeast District; A. E. Dickey, Twin Falls inspector, Southwest District; Claude E. Simon, Sandpoint fire chief, Northern District; R. C. Young, state inspector, Boise, West Central District.

John R. Crawford, city electrician, Butte, was elected chairman of the Montana Chapter; Charles MacDonald, Anaconda electrical inspector, vice-chairman; and Walter Lindsay, REA inspector, Great Falls, secretary-treasurer.

Vacation Issue

Negotiations over the vacation issue in the Alameda and Contra Costa County branches of Northern California Chapter, NECA, were given another peculiar twist that sent the issue back again to presidents McChesney of NECA and Dan Tracy of IBEW for reconsideration. Paul Geary, executive vice-president of NECA, made a special trip to Oakland to suggest re-submitting the issue and after considerable discussion, the contractors did so.

Another twist in the situation came when the union in Los Angeles ignored the NECA Chapter and signed up a new agreement with increase in pay and a vacation plan with an independent association of contractors in that area. The Los Angeles Chapter had previously been recognized as the bargaining agency for the employers.

● ATTENDING the annual sales conference of the Edison Electric Institute in Chicago on April 6, 7 and 9 were Vic Hartley, PCEA's managing director; R. R. Walbridge and H. C. Rice, Southern California Edison Co.

N. W. Engineers Discuss Power Shortage

PLANS for meeting an almost certain power shortage in the Pacific Northwest during 1948-49 were important topics discussed by engineers of the Northwest Electric Light & Power Assn. meeting at Spokane, April 14-16. Private and public utilities and the general public are working cooperatively to impress appropriations committees with the necessity for sufficient funds to step up construction schedules on authorized Columbia River federal power projects, said J. E. E. Royer, vice-president of the Washington Water Power Co. Latest forecasts reported by E. N. Peterson of the coordinating committee of the Northwest Power Pool indicate a peaking deficiency of 200,000 kw. on a pool peak of more than four million kilowatts under "average" water conditions. The condition represents a 75% probability factor. Under this condition energy would be 90,000 kw. short. Load could be carried under near ideal conditions of fuel and water without affecting the public too much, but the probability of near ideal conditions occuring is too remote to count upon. All possible ways of coping with the situation are therefore being discussed. Load moulding, or keeping certain loads off the peak, will be one of the first measures taken.

Cavitation, corrosion and erosion in hydraulic turbines were discussed by William J. Rheingans, Allis Chalmers Mfg. Co., Milwaukee. Cause of cavitation was shown by a motion picture film taken at 20,000 frames per second. Cavitation is not produced by release of free hydrogen as some believe, but by mechanical hammering from the formation and collapse of air bubbles at points of low pressure and high velocity. This action can produce pressures up to 50,000 lb. per sq. in. on metal surfaces of turbine runners. Lower water velocities, higher pressures and resistant metals are remedies. Turbines have been mounted lower to increase back-pressure from the tailrace, but the limiting factor in this direction is reduced economy. Stainless steel has been found most resistant to cavitation and is now widely used in repairs and as an overlay on cast steel in new runners at points of cavitation. It is also the best answer to erosion and corrosion.

Latest devolopments in fuse-link design radically affecting their application and performance were presented by J. R. Conrad, S & C Electric Co., Chicago. A new material known as Arctrol has been incorporated in fuse links to assist in finally making cutout performance satisfactory on low fault currents. When Arctrol is used in the link sheath to replace paper or fiber, completely successful fault current interruption is had on 12.3-kv. circuits at 32 amp. in an open-link fuse with a reduction in arcing time to three-quarters of a cycle.

This new development was announced and a motion picture shown for the first time to the industry at the Spokane meeting. Conrad pointed out the importance of effectively clearing low fault currents as an essential to securing secondary short-circuit protection in current-day primary fusing practice for distribution transformers.

A life expectancy of from three to five times that of conventional transformer oils was held for a new inhibited insulating oil described by Dr. R. C. Larsen of Shell Development Co., Emeryville, Calif. Accelerated laboratory tests showing the oil's remarkable non-oxidizing, non-sludging and long-life properties have been confirmed in the field by several large power companies, he said, and the new oil promises to do as much in the electrical field as inhibited turbines oils have done in the mechanical field. Cost is 3c per gallon more than conventional transformer oils.

A. A. Noon, Puget Sound Power & Light Co., described a new electronic device for locating faults on transmission lines and other electrical circuits. Ultra-high-frequency waves propogated over the line are reflected back and show as pips or humps on an oscilloscope screen. The instrument measures the time interval and reads direct in miles of line to the fault. Field tests indicate reliability and great promise. The instrument known as a panoramic fault locator is made by Radar Engineers of Seattle.

Other deliberations of the electronics committee included work of the Northwest Utility Radio Assn., how it will function in frequency coordination and assignment of frequencies, by W. A. Leidigh Jr., Portland General Electric Co.; and high-lights on new transmission and telephone line carrier for communication, telemetering and supervisory control which will fill gaps in the Northwest Power Pool and facilitate operation, by W. H. Blankmeyer, Montana Power Co.

A wide range of subjects was covered by Joe Hellenthal, Puget Sound Power & Light Co., and his electrical equipment committee. He said great care must be used in settings for unit substations to prevent corrosion underneath and thinks manufacturers can help. $1,200 is added to cost of foundations due to this difficulty. Despite standardization, cost is $15 per kva., whereas it should be about $9 for 3,000 - 5000-kva. unit substations, he feels. C. E. Cannon said long delivery on instrument transformers has led Washington Water Power Co. to use bushing-type transformers for record metering. Waldo Enns, Portland General Electric Co., said the industry is watching development of 115-kv. load-break switches for use in place of oil circuit breakers as a means of reducing costs of small and medium substations. Corbett McLean, Pacific Power & Light, said there is need for means of working on tap-changing under load equipment without shutting down transformers.

Cecil Kirk, Montana Power Co., believes the engineer needs a new point of view. He is doing things as of 20 years ago. His company is starting to eliminate high-tension fuses for economy, feeling that power transformers are now sufficiently reliable to take a chance. A cheap airbreak switch is another development. He would like to see a simple unit substation with small transformer (500-kva.), step regulator and small OCB all in one case. R. S. Daniels, California-Oregon Power Co., said they are saving $250 by metering only one phase on three-phase lines where metering is for record purposes. Also, they use bus regulation on small subs to save regulators.

R. C. Setterstrom, Montana Power Co., said they were going to use FM carrier extensively for supervisory control of non-attended substations. He showed a pinwheel lightning arrester developed by an employee that is effecting economies in lightning protection. Idaho Power is using carrier alarm in supervisory employees' homes to warn them when power is off. Leonard Walker, Idaho Power Co., described automatic sectionalizing of a 106-mile, 110-kv. line for fault locating. An air-operating mechanism for an ordinary hand-operated disconnecting switch is used. Chief problem was mak-

ing it work under temperatures down to 40 below.

For the first time a newly formed purchasing agents' committee had a place on the engineering section program. It was felt that this group had much in common with the engineers and that both could profit by interchange of problems. A splendid program was put on under J. A. Riner, Washington Water Power Co., chairman. Points made by him and his committeemen included: efforts of engineers to bring about standardization have greatly assisted the PA; purchasing is closely related to other departments and functions and much can be gained by having the purchasing agent sit in on engineering and budget meetings; the PA should not have taken away from him prerogative of selecting the supplier, once an approved list of suppliers has been set up; salesmen are our best friends—new concept is to treat them courteously; purchasing agents can be of great help in negotiating equipment contracts; number of makes of equipment must be watched to keep down inventory of parts; greater efforts should be made to anticipate requirements.

Section chairman Lester R. Gamble is to be complimented upon a well-rounded engineering program, as also is his arrangements chairman, E. H. Collins, for the fine entertainment and inspection trips provided.

Oakland's apprentice committee which sponsored the electrical group included: (seated, left to right) Homer Wilson, Local 595, IBEW; Dan Bronson, chairman Northern California Chapter NECA; G. W. Leydecker, 595; Walter Vance, Pacific Electric Motor, chairman of the committee; Harry Kurt, 595; Fred Hammer, president 595; James Havens, contractor; back row, Ralph Dalman, California Division of Apprenticeship Standards; Ray Carey, manager, Northern California Chapter, NECA; O. Kelly, California state employment service, and Loren Stevens, Oakland Public Schools, where classes were held

Graduating Apprentices

A huge mass graduation of apprentices, the first in the United States, was held in the Oakland civic auditorium arena April 15 for 457 graduating apprentices in Alameda and Contra Costa counties. The electrical apprentices, numbering around 50, were given diplomas. The joint apprenticeship training committee of the Northern California Chapter, NECA, and local unions 595 and 302 participated prominently in the proceedings. Mark E. Andrews, assistant secretary of the Navy, gave the feature address of the evening.

Graduation ceremonies for apprentices in the San Francisco area were held April 7 at the Building Trades Temple auditorium. George W. Abbett, chairman of the joint apprenticeship training committee, and members of the committee participated in the ceremonies. W. J. Farley acted as chairman of the meeting.

The energetic Rocky Mountain Chapter of NECA has just wound up its Architects and Engineers Seminar held at the Gas and Electric Bldg., Electric Institute, on Mondays, April 12, 19, 26, and May 3. Starting with a meeting on lighting April 12 under moderator Dale Strohminger and with Harold Rankin and Ray Hankins talking on planning and designing, the second meeting went into electrical loads and requirements with Karl Krummel as moderator. Howard McCallister, Ralph Johnson, Ted Foulk, and Victor Moulton discussed power circuits, branch circuits, wiring devices, and codes respectively.

Panelboards and distribution systems came next on April 26 with Paul Jussel as moderator. James Humphries, Vern Storey, Troy Hugart, and A. J. Morroni handled descriptions and applications, communication systems, and new ideas and novelties.

But the highlight of the entire series was the last one on Monday, May 3, on plans and specifications, over which Al Zito was moderator. Ray Ashley, electrical engineer of Chicago, assisted by Burns Colby, Public Service Co., presented the program. A separate symposium on estimating for contractors was held during the day times of both May 3 and 4. Subjects covered included estimating tools, forms, procedure. Under procedure was quantity take-off, listing and pricing, listing on summary sheets, plans and specification records and study of plans and specifications. On Tuesday operating costs came in for study with overhead and installation-only projects. Training of estimators, time studies and residential wiring under the Collins four-unit method wound up the seminar.

Don Larson, manager of the chapter, recently issued a calendar of meetings and activities in which this energetic chapter will be prominent. It runs from April through to the Frontier Day celebration in Cheyenne on July 30. He also issues a sprightly bulletin each month.

NECA

A meeting of representatives from all of the chapters in District 6, comprising the states of Oregon, Washington, Montana, Idaho, Utah, Nevada and California, will be held at the Multnomah Hotel in Portland, Saturday and Sunday, May 15-16. Chapter governors, presidents and managers and representative individual members from areas not organized into chapters will attend. Paul Geary, executive vice-president of National Electrical Contractors Assn., Washington, D. C., will be present following a talk to the Northwest Electric Light & Power Assn. meeting at Victoria earlier in the month. Arrangements are being made by T. L. Rosenberg, vice-president, District 6; E. R. Cornish, field representative; and by the manager of the host chapter in Oregon, I. W. Rodgers. The theme of the meeting will be "Sell All NECA Services—Not Just Labor Relations." Cornish returned recently from a research committee organization meeting in Chicago at which the technical and research data of the association was discussed and methods set up for furthering this part of the program.

San Francisco Electrical Contractors Assn., in a plea supported by local union No. 6 and electrical manufacturers, made so strong a case for electric trackless trolleys before the mayor and board of supervisors of San Francisco that the latter rescinded orders

for gasoline-driven motor coaches for the Municipal Railway and placed orders for more trackless trolleys. The group was able to prove economy in operation and maintenance for the electrical transit buses as opposed to gasoline-driven coaches.

An invitation was issued to the Peninsula Electrical Contractors Assn. by the San Francisco Chapter, NECA, to join it in NECA membership. The question was being submitted to individual members of the Peninsula association for final vote. The Peninsula association held its annual banquet last month, March 31, at Villa Chartier, San Mateo County. Retiring president W. F. Klose, San Carlos, installed K. B. Van Bergen, Tecco Co., San Mateo, as new president. Other new officers are: Lon Roya, Coast Electric Co., Redwood City, vice-president; Joseph Dingman, Redwood City, treasurer; Everett Marshall, San Carlos; W. Kennedy, Daly City, and E. A. Mueller, Redwood City, directors.

IAEI

A more than suspicious eye was cast at low-voltage relay control wiring by several inspectors and electrical workers union officers who spoke about the latest popular development in house wiring at the joint meeting of the Northern and Central California chapters of International Association of Electrical Inspectors, meeting in the home city of the president of the Southwestern Section, H. H. Moore, city electrician, Modesto, April 17. The meeting was attended by 108, and 41 ladies, wives of the members. The latter were given a trip to Don Pedro dam by Charles Plummer, electrical engineer, Modesto Irrigation District.

Discussion of low-voltage relay control came in the afternoon session presided over by L. B. Sterling, chief inspector, Fresno, who read a draft of a new ordinance proposed in that city to control this type of wiring. Most of the heat over the system seemed to be generated over a possible reduction in installation work, although a lot was said about shoddy bell-wire installations and the possible later elimination of the relay in case of failure and attempted use of the low-voltage wires for a straight switch leg.

The morning discussion session was presided over by James Ambrosi, Oakland inspector, chairman of the Northern California Chapter.

Joe Howe, business manager, Local 100, Fresno, spoke, explaining that his union has prepared a booklet and Fresno contractors had distributed it to all residential customers, advocating safe wiring by qualified electricians. At noon a barbecue luncheon was served all the men by the Modesto electrical contractors association and the unions in the area.

Next meeting of the Central California Chapter will be at San Luis Obispo, Sterling, its chairman, announced, on July 10. The Northern California Chapter will meet somewhere in Sonoma county in June.

Intermountain Electrical Assn.

Research Proves Some Interesting Frozen Food Facts was presented to a large group of dealers and distributors under Intermountain Electrical Assn. auspices at Hotel Utah, April 22 by Julia Kiene, manager of Westinghouse Electric Corp., Home Economics Institute. Mrs. Kiene was also a featured speaker at the Utah State Home Economics Assn. Convention April 23 and 24 in Salt Lake City, being the Friday evening speaker. She also addressed one of the section meetings on Saturday on *Good Nutrition Doesn't Cost Money*. Evelyn Hansen, Utah Power & Light Co., was elected chairman of the Home Economics Assn.

With '49 day whiskers Harry Moore, president Southwestern Section, IAEI, welcomes joint chapter meeting to Modesto. Cecil Moore, contractor president, also extended welcome. Below, Central California Chapter chairman, L. B. Sterling, standing; James Ambrosi, northern California chairman, at right; M. K. Bliss, secretary, left

IES

"American needs better lighting in every field," Sam B. Williams, customer relations manager of Sylvania Electric Products Co., told IES members at a recent meeting of the Puget Sound Chapter in Seattle. His talk, directed to lighting and utility men, pointed the way to constructive lighting developments throughout the nation. Meeting drew representatives of the British Columbia Chapter of IES as well as local men.

Illuminating Engineer George C. Smedberg of Associated Lighting Service, San Francisco, talked to members of the Southern California Section about combining the utilitarian with the esthetic—amplified his speech with demonstrations and illustrations . . . Special dinner meeting and Ladies' Night on May 5 featured J. W. Howard, district engineer of G-E Lamp department.

There's talk of organizing two more IES chapters, one in Honolulu, the other in Sacramento. Plans for forming a Sacramento Chapter took definite shape at a meeting held late in March. Chairman of the evening was A. L. Perdue. John Walsh sketched the history of the society. Marcell Vogel was on the program with the subject, *Black Light*. Committee urged all interested in forming a chapter to attend these meetings.

C. M. Cutler, director of commercial lighting, General Electric Co., Nela Park, who had come West to address a convention of independent theater owners in San Francisco, gave a unique demonstration and a clear-cut talk on *Planned Store Lighting* at the Northern California Section IES, April 12, and also to a meeting of a potential chapter of IES at Sacramento as well as, later in the month, to a lighting meeting in Los Angeles. Cutler demonstrated a number of new uses of plastic, perforated metal, cut-outs and shadow boxes to produce interesting and unusual lighting decorative effects.

Electric Clubs

San Francisco Electric Club heard what the electric power situation in Germany is from Roy A. Wehe, California Public Utility Commission, on April 26. Wehe had returned from a seven-week tour of Germany and Austria as a member of an American commission. The same meeting was used by the Northern, Central, and Southern California chapters of International Association of Electrical Inspectors for the presentation of a camera to George E. Kimball, retiring supervising electrical engineer for the California State Division of Industrial Safety.

ELECTRICAL WEST

Call A Sales Evangelist

CAN an industry lose its sales cunning and sales technique? Can salesmen go stale? Will lost salesmanship be reflected throughout the whole fabric of an industry? Chalk up an affirmative answer on all three of these questions, especially when an industry has had nothing to sell for six or seven years.

That is just about the plight of the electric utility industry at this moment. During the war all selling was forgotten because all of the industry's manpower and service was directed principally to contributing to the war effort. Since the war, it has been plagued by lack of capacity, lack of equipment, and here in the Far West, by actually lack of energy to meet normal demands.

Realization of the sad state of the utility industry's salesmanship can quickly be achieved by contrasting a manufacturer's sales meeting with any kind of a utility gathering. In the first instance there will be a forceful and convincing job of selling a product, its service and the company behind both. The experience of attending such a gathering should be refreshing and, if the meetings are like some we recently have attended, there will be no sleeping and no one will leave the room because of boredom. Contrasted to that are some utility meetings where we have left with a feeling that this industry now has too many people, who, in private and before the public (1) are not salesmen; (2) who do not believe in their company or their industry; and (3) who apparently harbor grave doubts about both.

The remedy for this sad state of affairs would appear to lie in a concentrated dose of oldtime sales evangelism. Seasoned sales managers know what is needed—inspiration and courage and a new sense of importance.

Fortunately the basis for such an evangelical approach exists. The electric industry has one of the outstanding records in the annals of the American enterprise system. It has consistently furnished a better product, with better service at a lower price. It is one of the few industries in America where the product is generally produced, transported and delivered under one management. It has contributed as much or more to human comfort, to productive efficiency and to high living standards than any other industry. Its war record was unparalleled.

Because basically the electric utility industry is a service industry, it must ever be sales-minded and sales conscious. It must continually sell itself and its service to its employees, its customers and the public. It cannot look to its friends to do the job for it. If the industry ever should fall, it will be because it has failed to sell.

A Page From The Phone Book

SHOULD it be necessary for the power companies to increase rates, they might well take a dose of the same kind of courage exhibited by the Bell telephone companies recently when they faced a similar situation. In state after state the telephone companies made strong cases for themselves before regulatory bodies. They showed conclusively what higher wages, higher material prices and higher construction costs had done to their operations. They received the relief sought and then they convinced the public that the increases were necessary and just. Thinking back, we can't remember a single complaint about the higher phone rates.

Earn The Credit

AN investment banker who has had much to do with past financing of utilities made some cogent off-the-record statements about the current worries of power company managements. He pointed out that the electric utilities had always been great and desirable places for the investment of funds. Instead of worrying where the money is to come from to finance the present and future huge construction and expansion programs, utility managers, in his opinion, should devote more time and attention to thinking about how they are going to earn a reasonable and attractive return on their present and future investment. That will do more to attract capital than all of the

EDITORIAL VIEWS

scheming in the world. He points out that there should never be any kind of a checkrein on plans that will improve earnings. And the diversity of the electric power business means that opportunities in that direction are almost unlimited.

People Build A Company

IN an editorial commemorating that company's 78th year, *Lines*, the employee magazine of Public Service Co. of Colorado, reiterates a sometimes forgotten fact—"People built this company. *People* operate it. Its future lies in the hands of *people*."

The history of any company, whether it be a dealer's, contractor's, manufacturer's, wholesaler's or utility, is always of what people did to make or break it. The physical properties, plants, pole lines, materials—the money with which to buy them, the plans and programs, were all tools which these people used with which to create and develop an enterprise.

In early times people were taken for granted. Today they demand much attention. We give this attention they require abstruse names like "labor relations," but even that does not change the fundamental fact.

It is *people* that *are* a company, and that make or break it. If these people work harmoniously, they build it so that all may have more to share. If they merely put in time, they destroy the thing from which they derive their livelihood—the company. The company is no abstract thing —it is the people themselves.

In Good Faith

AT times those who have had the misfortune to have to negotiate with a union wonder if there is any integrity in the leadership of such organizations? Do promises mean anything? Is there such a thing as "good faith"? Only in the decadent Oriental countries where it is trickery and evasion that seems to be the pattern, not "good faith" in living up to the spirit, as well as the letter of a contract, can some of the tactics used be found. Decent business was never built upon such low-grade ideals. Lasting benefits to those who have delegated their own bargaining rights to some leader, one feels, cannot come from such methods and attitude. Only "bad faith."

IF this nation's high level of productivity and consequent high standard of living are to continue, the tools of industry must be replaced and improved as needed. The additional funds required for this purpose can only come from re-invested profit or additional financing. Industry's profits are being severely taxed and the high level of personal income taxes has a tendency to dry up future sources of investment capital. No matter how the tax structure is set up, if government expenditures continue to increase, there will be less and less for all of the people. For even though business and industry paid the whole original tax bill, the money going into the Treasury would still come, even though indirectly, from the pockets of 142,000,000 Americans, with industry acting as the tax collector. The theory that high taxes tend to curb inflation is directly contrary to the facts. For the greatest single purchaser of many items in today's market of limited supply is the government. To maintain national productivity, individual companies and corporations must purchase needed materials and supplies in the face of government competition for these materials, no matter what the cost, or go out of business. In the same manner, people must purchase food in competition with the government, who is a very large purchaser in this line, no matter what the cost. And as long as the national budget remains at its presently high level, the government purchasing power will not only tend to increase the inflationary spiral, but the dangerously high tax rate which exists will become increasingly more burdensome on the 142,000,000 people who, in the end, are the only ones who actually pay all taxes.—Reese H. Taylor, president, Union Oil Company of California.

SHOW

STARTED by the Electrical Maintenance Engineers of Southern California last year so successfully, industrial electric shows have now become major affairs with excellent results to exhibitors because of selective audiences interested in their products. The EMEA of Southern California enlarged its show, March 19-20, at the Los Angeles Armory and permitted 78 industry exhibitors to use 9,300 sq. ft. of space at minimum of cost and reach 10,550 people. Tabulated, this included 181 plant owners, 201 managers, 167 general superintendents, 6 plant presidents, 2,639 electricians, 667 electrical engineers, 357 maintenance and service engineers, 232 electrical contractors, 319 sales and lighting engineers, 216 purchasing agents, 110 draftsmen and designing engineers, 65 estimators, 52 inspectors, 262 mechanics and machinists, 305 industrial foremen, 229 utility workers and 202 miscellaneous engineers, as well as many other classifications. They were all people whom the manufacturers wanted to reach to show new products and materials.

It was strictly an EMEA show, its members not only managing and running it, but a large number of volunteers worked almost all night prior to opening making eight sizes of panels for uniform backgrounds and installing an exceptionally flexible electric supply system for exhibitors, of trolley duct and three-phase buses protected by multibreaker panels. Homer M. Eversz was show chairman; Emerson Reichard, past president, show manager, and all from President Henri Ledeboer on down assisted.

San Francisco's EMEA show, April 2-3, was its first. Held at California Hall, which was too small for its 40 exhibitors and 4,650 visitors, it was a huge success.

Electrical Maintenance Engineers of Northern California, (top) filled old California Hall with exhibits for the first show they had tried. Even had Army Signal Corps exhibit, in which Phil Stolz, EMEA assistant show chairman; Tone Gray, EMEA president and show chairman, and Fred Gerrick, EMEA vice-president are seen with army staff. The biggest ever was the Southern California EMEA Industrial Electrical show, at left, in which its officers (bottom picture) exceeded all expectations. Emerson Reichard is here being given his show manager badge by Henri Ledeboer, EMEA president, while a few of committee witness event

TIME

APPLIANCES played a big part in the home shows that blossomed in April in Sterling, Colo., Seattle, and San Francisco, and can be expected to try to steal the shows in Los Angeles, Pueblo and Sacramento as well, perhaps in several other cities, during the next three months.

Sterling's Farm Home Electric Festival, April 2-3, held in conjunction with the turning on of a new street lighting installation, followed the pattern of the Monte Vista fair last fall. Dealers and the Public Service Co. of Colorado, as part of the "Denver Plan" of cooperation between the two initiated by G. B. Buck, vice-president of sales, ran joint full page ads, dealers made displays of their merchandise and the utility put on its House of Magic show each night, a cooking school each day. Purpose was to show people of such towns how much could be bought from the local dealers.

Seattle Home Show and Household Fair, March 27-April 4, was entered in a big way by the electrical industry in Seattle. The Appliance Dealers Assn., organized a strong committee headed by W. A. Watts, president, and Dave Allen, secretary, to participate. Two days were designated as dealers' days, with special previews before crowds entered. More than 100 dealers attended a special buffet luncheon. Attendance totaled 88,500.

San Francisco Home Show, first in years, was strongly electrical in content, with G-E, Westinghouse, L. J. Meyberg, Frigidaire, California Electric Supply and others in prominent places. Held April 7-14, it played to about 75,000 who paid admission. No entertainment was used to draw crowds, attesting to interest in home building. California Electric Supply's Lightolier exhibit at the entrance gave it an electric brand.

Similar to this performance at Monte Vista, Colo., last November was the main tent at the Sterling (Colo.) Farm Home Electrical Festival, April 2-3, which combined a dealer show with celebration of a new mercury street lighting installation (top picture). Public Service of Colorado put on a House of Magic show and cooking schools. Center group was Seattle Association of Appliance Dealers committee which turned a Home Show into an electrical one. In it are McDermott, Clibbon, Soden, chairman, Dave Allen, association secretary, Stasser, Tyler and Hosey. Bottom view: Westinghouse area in big San Francisco Home Show, April 7-14

Montana Trains Salesmen

Distributor group which took the sales training course put on by Montana Power at Billings. D. J. McGonigle, second from right, ran the course

Sales training of dealer sales people will be Montana Power's major promotional activity for the year, declared D. J. McGonigle, general sales manager, in outlining the scope of the program that will cover all of Montana served by that utility. The program is already well under way and will fan out from the divisions of the company after the basic training program is presented in the major division cities.

Distributor salesmen were given the first course in two major distribution centers, Billings and Butte. Billings meetings ran from Feb. 23-27; those in Butte March 24-27. Dealer courses started in April in Billings, Butte and Great Falls, with Missoula scheduled for May. From these major cities the division sales staffs will carry the courses into the smaller towns of Montana.

Cooperating with Montana Power in the series are Central Distributing Co., General Electric Supply, Great Falls Paper Co., Graybar, Kelly-How-Thompson Co., Marshall-Wells, Midland Implement, Northwestern Auto Supply, Parker Montana, Taylor Distributing Co., Ellis Paint Co., International Harvester, Missoula Mercantile Co., Monitor Home Appliances, Inc., Montana Hardware, Northwest Supply Co., and Westinghouse Electric Supply Co.

Course used is the Edison Electric Institute-National Electrical Wholesalers Assn. basic training course and instructors are drawn from the Montana Power sales personnel and executives of distributors. D. J. and E. D. McGonigle, John Kromer, E. R. Buck, C. J. Burns and Mary Ann Gates conducted the original classes, with distributor executives acting as chairmen or handling some parts of the program. Attendance at the dealer meetings will be stimulated and promoted by the distributor salesmen who have already taken the course.

Moore-Tally Now

Claude Saviers, president of Saviers Electrical Products Corp., Reno, and his son, Emmett Saviers, vice-president, announced the sale of the retail division of their business to Moore-Tally Inc. on April 1. The new corporation formed by Joseph Moore and Milo Tally will continue retail sales of electrical appliances at the present location in the Saviers Bldg., at the corner of Second and West St. The wholesale division will continue to operate under the name of Saviers Electrical Products Corp., and will move to a new building at 640 Sierra St., Reno.

The Saviers business was founded in 1907 by H. E. Saviers. Claude Saviers joined the organization in 1914. His son Emmett began working for the firm in 1946 after military discharge.

Joe Moore and Milo Tally have been in Saviers employ since 1945 in executive positions. Prior to 1945 they were both with Westinghouse. In their new ownership they will continue to sell all appliances handled by Saviers over the past 20 years, and will maintain the same retail staff.

● W. L. McCULLOH has been named Southwestern regional manager, domestic appliance division, Pressed Steel Car Co. Inc., according to A. Raysson, general sales manager.

Paul Bradner, traffic appliance factory representative from Westinghouse Electric Corp., San Francisco, shows the new models to L. E. Wood, appliance dealer of Idaho Falls, at the Salt Lake City showing. Diamagic backgrounds were used in a variety of ways throughout the large Hotel Utah rooftop ballroom where dealers came to view the line

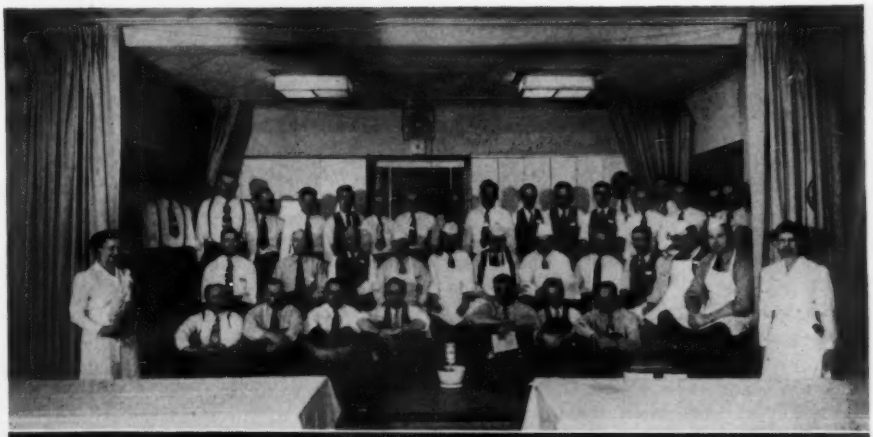
Television Comes to Salt Lake City

Television has started in Salt Lake City. Moreover television received some of the world's best promotion in that same city, mecca of the Mormon church, during the huge spring conference of the Latter Day Saints, April 3-6, when the church-owned station, KSL, used portable studio equipment in the Tabernacle to pick up the speakers and the chorus and telecast it over coaxial cable to the overflow crowd in an adjoining assembly hall. Some 10,000 people thus saw and appreciated what television could do. Those who saw it went about telling their friends of the telecast, and, if from distant cities, went home talking enthusiastically about it.

It is another Salt Lake station, KDYL, however, that is launching regular broadcasts of television, Monday, Wednesday and Friday evenings, from 8 to 10 p.m., with test programs each afternoon from 3 to 4 o'clock for dealers to demonstrate sets. Test broadcasts began early in the month, but regular telecasting was launched with fanfare and talks by the governor, mayor, and other celebrities, April 19. At a big electrical industry meeting a month ago, sponsored by Intermountain Electrical Assn., KDYL told of its plans and presented a test broadcast. Howard Price, newly elected president of IEA spoke to the group by television at that time.

The church conference telecast, however, gave the multitudes of church followers a closeup of the leaders of their religion speaking to them. The television idea, vague until then, crystalized into something new and vital and alive. Telephoto shots brought the speakers close to those who saw the broadcasts, closer than if they had been in the Tabernacle, even, during the conference.

Vince Clayton, chief engineer, and Mel Wright, engineer, described the KSL test as a preliminary to that station's own broadcasting later, although it is not intended to do so until network programs are available. The test was made with two Dumont cameras, one with telephoto lens, located in the Tabernacle balcony. Six Dumont receivers were located in the adjacent assembly hall where a large overflow audience was seated. One monitor on the stage gave a 20x20-in. picture, the others an 8x10. One Packard-Bell, sent by the Pasadena Stake of the church, and one Stromberg-Carlson receiver were also used.



Two sales events in Salt Lake City recently, both flavored with General Electric, were meetings of the G-E Supply Corp. and, entirely separately, of Hotpoint—with Graybar officiating. A week of sales meetings for 75 G-E Supply men from Utah, Idaho, Wyoming and Montana, addressed by E. E. Potter, G-E vice-president, culminated in a cooking school for all the salesmen, pictured above. Mary Poulsen, home service advisor, and Evelyn Hansen, home service director, Utah Power & Light, taught the men to cook on the ranges they are out to sell. The group below them is the Graybar general staff aiming to put Hotpoint in front in the Mountain states. S. B. Cooper, Salt Lake manager; Blaine Lind, merchandise manager, San Francisco; D. W. Rennewanz, Hotpoint Pacific district manager, and J. J. Martineau, appliance manager of Graybar at Salt Lake City, told a large dealer meeting of 1948 plans and lines

In a compact and well-organized arrangement, Ray Jones of Denver carries a tremendous stock of washing machine and appliance repair parts of machines dating "way back when" and the newest makes. Genuine parts are carried when possible

Utah "Sell All-Electric" Plans Outlined

WHAT does it take to have the public "Go All-Electric?" A program for the industry to "Sell All-Electric," naturally. And such a program is what is being sparked in Utah and western Colorado by the Utah Power & Light Co., assisted by the entire industry. It is the theme for 1948, a natural followup of last year's "Better Living, Better Business, Better Farming, Electrically."

In a series of meetings which began in January and ended in April and reached 1,007 power company employees, wholesalers and distributors and dealers, W. A. Huckins, sales manager, and his staff "troupe" set the program in action. It will now be furthered by home service, demonstrations, sales campaigns, advertising and promotion by the utility to keep the selling tempo high by all sales outlets.

Wholesalers, 37 of them, were given the first preview, Jan. 23, in Salt Lake City, in order that their sales personnel would be acquainted with the plans, enthusiastic about them and assist in carrying them to their dealers.

Company personnel of the utilities, Utah Power & Light and Western Colorado Power, 159 in all, were given the story by divisions. W. A. Huckins presented the over-all picture, J. F. McAllister, the residential and farm market, J. H. Shaw the commercial and government-municipal market, Glenn B. Walker, the industrial market, Evelyn Hansen, home service activities, and M. L. Cummings, advertising and sales promotion. All were enlisted in the campaign.

Dealers then were invited to dinner meetings; 637 in total attended the 12 meetings where J. F. McAllister presented the opportunities of the market for "selling all-electric" as the company advertising told the public to "go all-electric." (See Sales Guide for selling ideas McAllister presented.) He also explained how to make use of the low rates in selling. A clever slide rule and a chart of average electric usage for each appliance was given each dealer and he was shown how to use it to show how little the operating cost is for so much labor-saving service. Each dealer was also given a copy of a 32-page, bright and concise summary of the whole program, entitled, "*Accelerate in '48 — Sell All-Electric.*

Objectives around which the utility's program is planned, as reviewed to company personnel meetings by W. A. Huckins, may be briefed as follows: Develop the market for all electrical services; meet and combat competitive fuel competition; survey unserved areas to develop potential markets; encourage adequate wiring and assist in keeping costs reasonable; follow line extensions and aid to bring more electric service to more people; coordinate all branches of the industry so that all may work together, sell more, keep high sales practice standards, render better service; spend about $1,100 per day for sales assistance and advertising; sell no merchandise itself; increase sales force when necessary; execute promotional activities on all types of appliances; encourage dealers to operate service departments; increase home service; cultivate the farm market; increase commercial customer promotion; encourage new industries and help existing ones to use more electric services; use low-cost electricity as a sales appeal; do extensive advertising; continue basic sales training classes; conduct group demonstrations; tie in with and promote model homes; cooperate with schools in teaching uses of electricity; continue mass promotion and affiliation with allied associations; increase illumination standards and tie in with national Planned Lighting program; intensify the promotion of traffic safety lighting.

Huckins indicated that sales staff would be increased in the divisions, and the number of home service women increased also.

At dealer meetings such as at Ogden and Salt Lake City, and to division sales personnel meetings such as in the center picture the industry was alerted

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ELECTRICAL WEST Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

May 1948 ©

Lord, didn't it rain! Northern California dealers were singing this song as power restrictions were pulled off, first a little, then altogether. It had been a rugged time for many. One distributor decided to get out of appliances. A few dealers gave up the struggle. Some smart ones bought up a good surplus of scarce ranges and are set now for the new business.

All over now

But the new business is slow picking up its lost momentum. Distributors orders, even with the lid off, are spotty. Advertising is more extensive and price reductions are offered on "close-outs" of various lines.

Slow pickup

One bad bump to franchise committments came when one San Francisco department store, with a name brand franchise, sent two carloads of ranges it had received to another member of a national chain it belonged to, in Boise, which did not have that franchise. Anxious dealers who had been awaiting stock for so long blew up at that.

Crossed franchises

Desire for sales training is strong everywhere. Northern California Electrical Bureau classes in San Francisco, 11 in number, held 60 meetings; started with 415, graduated 384. Montana Power has started classes (see story); so has Southern Colorado Power. Old timers like Utah Power & Light just keep rolling along.

Want training

Annual sales conference of Southern California Radio & Electrical Appliance Assn. has been set by Bill Quinn for June 3, Ambassador Hotel. Its second annual industry-wide outing will be July 25 at Arroyo Seco Playgrounds, and its big All-Electric Exposition at Pan Pacific Auditorium is scheduled for August 20-29.

Dates

San Diego's annual summer conference of Bureau of Radio & Electrical Appliances is set for July 15, said J. Clark Chamberlain, manager. Annual Electrical and Home Appliance Show will be from Sept. 14-19. Space reservations open in midMay. Has been holding a fine series of sales institute meetings during April which will be reported on later.

More

Newest aid to its radio dealers is a Radio Log, published and distributed by the News Press of San Diego for the Bureau of Radio & Electrical Appliances. Each week 55,000 families receive it. The Bureau contributes a Radiotorial for its front page. Sixteen makers of radio advertise in it.

Radio help

Sierra Pacific Power Co. has taken on Reddy Kilowatt.

Reddy

Word is that Telluride Power Co., Richfield, Utah, one of the few remaining merchandising utilities, has decided to turn it over to the dealers. This is one of West's pioneer power companies, always a good cooperator. — Turn over

Don Hurley, president of Thor Corp., just finished a tour of the West, touching Seattle, Portland, San Francisco and Thor's El Monte plant. — Tourist

Oct. 1-2 have been set as the dates for the Intermountain Electrical Assn. big fall conference. Sid Cooper, Graybar, Salt Lake City, has been made chairman of the committee. — Confab

Manning-Bowman is setting itself up in true jewelers style in its new office and showroom at Western Merchandise Mart, San Francisco, space 445. George Watson, manager, waited patiently a long time for its lime oak finished display fixtures and samples of the M-B line, but they are set now. — Plush setting

With the same team pattern used so successfully in its electric water heater drive last fall, Southern California Edison, aided by all range and water heater distributors, is launching an electric range and water heater promotion beginning June 1, to run two months. Five or six four-man sales teams of Edison and distributor men will carry the plans to the entire territory at dealer meetings. The theme--"Electric Living is out in front." — Range drive

Reflecting for the first time the Avco touch, Crosley sprang a sensational line of new Shelvador refrigerators at a meeting of Western distributors, held in San Francisco April 8. Then each followed with dealer meetings. California Electric Supply, in San Francisco, covered northern California April 12-17. J. N. Ceazan Co. sprang its big dealer shows April 11-14 in Los Angeles and San Diego. Interesting sidelight: California Electric is refranchising, sifting out many non-productive dealers. — Plenty "hot reefer"

Silex and Cory seem to be having a battle over advertising copy that turns up its nose at rubber plugs as vacuum seals. Since both use rubber seals for some models it sounds funny. — Stretched

Tradewind clipper blowers have finally gone into production on an exhaust fan for installation within a wall cabinet above a range, a principle used successfully in many restaurant jobs. This domestic fan also draws off excess heated air from the ceiling. The unit includes filters and an adjustable hood. Was shown at the San Francisco Home Show. — Awaited

July 11-14 has been set as the time for another leadership conference of National Electrical Retailers Assn. in Chicago along with the Summer Market. Herb Names, Denver electrical dealer, its president, will handle the three days of meetings, among which will be more conferences to exchange views with manufacturers. — Summer meeting

Freon cylinders are again in such short supply that an urgent call has been made by the National Association of Refrigeration Contractors to service shops to get cylinders back promptly or there may be a Freon shortage when summer comes. — Unfreeze them!

San Francisco board of supervisors enacted the ordinance revision that requires a ten dollar annual inspection fee for stores selling electrical appliances to support the unsafe appliance prohibitions. — Sales control

Pardon us for a pint sized brag—but Electrical West really gives the appliance business the service. The Appliance Service Directory—the Manufacturers Directory in the April issue, with corrections and additions and changes each issue—The News Letter—The Appliance Sales Guide—The statistics and market figures for the West—Appraisals of cooperative advertising and promotion campaigns and the news each issue—It's more for anybody's money, in more concentrated form, than from any other source.

From us

Home Economics Workshop put on by the Home Economics Committee of PCEA in Los Angeles in February will be repeated in San Francisco May 19 and 20 in the Westinghouse Electric Supply Co. auditorium. Two-day program of demonstration ideas is headed by Marguerite Fenner. Dealers who have home economists are urged to send them to the workshop.

From L.A. to S.F.

Frigidaire displayed its new line of ranges, refrigerators, and commercial products at a dealer showing in San Francisco on April 26. Spring showing conducted by the Oakland sales office attracted 750 Frigidaire dealers and their salesmen who examined the new products, heard about Frigidaire's selling and advertising plans for '48. Chief speaker was William I. Buchanan, Pacific regional manager of Frigidaire.

Spring meet

Stepped-up freezer sales in the San Diego area were noted by dealers when San Diego Bureau of Radio & Electrical Appliances and the Home Planners Institute jointly sponsored a series of four public Home Freezer Clinics attracting more than 2,000 people. Programs were held in four San Diego high schools, starting off with the new Kelvinator movie, "Surprise for Janie," and followed up with a demonstration of packaging methods with suggestions for making the best uses of a freezer. Said J. Clark Chamberlain, bureau manager, "the idea is no longer an experiment—it has proved to be worth concentrating on."

Freezer clinics hot

Clark Division of McGraw Electric Co. has decided to use the "Toastmaster" name on the Clark electric water heater so that distributors and dealers can make quick identification with the well-known trademark which has appeared on the Toastmaster electric toaster for more than 25 years.

Instant identity

The Western Merchandise Exhibitors Association has announced dates for its fall shows. . . San Francisco Show will be staged August 1-5 in the civic auditorium concurrently with the Western Merchandise Mart Summer Market Week. . . Seattle Show will follow on August 15-18. Both shows will feature gifts, lamps, jewelry, toys, housewares, china and glassware.

Fall shows

Appointment of Richard W. Newell as West Coast advertising manager, Admiral Corp., has been announced by Seymour Mintz, director of advertising. Newell has been advertising and sales promotion manager for Kaemper-Barrett, San Francisco distributors for Admiral.

Change

Bendix has been congratulated from all sides on their recent 7% price reduction on two models of Bendix automatic washer including a word of praise directly from the White House.

Lowers prices

Betty Crocker's endorsement will soon be on a toaster, food mixer and coffee maker, according to General Mills. New products are due on the market this fall. . . Meanwhile the company is pushing plans for introduction of its steam attachment for the Tru-Heat iron booked for May and June.

Sponsors new items

"The Eyes and Ears Have It" is the new personalized home instruction course designed for use with the Conlon household ironer. Illustrated easel book explains the fundamentals of operation with a sound record playing simultaneously giving all the details of the ironer. Instruction course solves the problem of sending an instructor to the new owner's home, also eliminates time spent in store demonstration and teaching.

With a book and record

Guide for electric water cooler servicemen has been prepared by Ebco Manufacturing Co., Columbus, Ohio, entitled "Service Manual and Parts Lists—Electric Water Coolers." Copies are available through Ebco.

Guide out

Sylvania has a new way of demonstrating a complete line of fluorescent fixtures with its Fluorescent Home Fixture Merchandiser. This aid to dealers mounts nine residential fluorescent lighting units on a 4x7-foot panel board and is ready to set up in store windows or against display walls; is equipped with individual control switches for each fixture; in addition Sylvania has seven corollary sales aids to go with the merchandiser as a follow-through technique, including counter and window display cards, posters, booklets and folders.

Light display

New $269.50 television set of Emerson Radio and Phonograph Corp. is on the market now; has a 52-square inch screen and is known as model 571. Company has also released a three-way personal portable, model 569, to sell at $39.95.

New ones

Motorola is spending about $2,500,000 in advertising this year. Campaign opens in May with ads in national magazines, trade papers, and a cooperative newspaper program. Direct promotion will be with dealer aids, merchandise displays, interior banners and window decals. Spring and summer phase of the drive will feature Motorola's new Sporter, portable five-tube radio, to sell at $49.95.

Plenty of promotion

General Electric announces that it is now producing its lowest priced table radio sets in seven years. Eight new models will have Western list prices from $20.95 to $28.95.

Cost less

New seven-point electric water heater promotion campaign launched by Hotpoint includes market studies, dealer and distribution cooperation, utilities support, advertising, sales promotion and training, and dealer presentation. . . Hotpoint is also working on a product display program through its distributors aimed at a "neon sign for every dealer" and a display background for every product.

Seven points

Westinghouse is using a new method of showing its electrical appliances—called the DiaMagic display. Basic elements of the display are oak frame screens, drapes and selling cards. Screens can be used to display a single or combination of appliances. Variety of uses for the display are illustrated in a booklet put out by Westinghouse.

Build it

Report from Landers, Frary & Clark is that they have invested $70,000 in a series of dealer educational films for the training of Universal major appliance distributors, dealers and their employees in the merchandising of Universal electric appliances. Visual training aids include a series of slide sound films, training guides and product manuals developed around electric ranges, water heaters, vacuum cleaners, washers, ironers, traffic appliances and the new Bantam range.

Invest for Profit

Cory Corp. has been holding meetings of all sales personnel in Chicago, Los Angeles, and New York to brief its salesmen and managers on promotion strategy for 1948.

Briefing sessions

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ELECTRICAL WEST

Sales Guide

FOR THE ELECTRICAL MERCHANT OF THE WEST © MAY, 1948

To Trade-in or Not to Trade-in?

THIS question comes into the life of every appliance dealer or salesman—many, many times. People who, a few months ago would have given anything for any kind of appliance they needed and never thought of asking for a trade-in, now face a market pretty well supplied with a variety of brands and makes. They are in a position to do some trading now. The buyer has taken over. When he or she does trade-ins reappear. What to do about them?

A certain percentage of them are so worn out or obsolete that they ought to be junked. They are not worth trying to save to handle the wanted service for the people who do not make much money and can't afford a new one.

The still usable range, refrigerator, washer, ironer or radio offers an efficient dealer a chance to increase his market in the lower income families by handling usable trade-ins in such a way as to make a reasonable profit on them. Many set up a separate department or even a separate store for used merchandise, advertise it and do a good business in it.

"Who is going to buy the new appliances?" asked J. F. McAllister of Utah Power & Light at a series of dealer meetings. "Obviously, in a well saturated market, it is those who already own one. That brings with it the question of what to do with the old one. Shall you take it in and try to sell it? Before doing that in each case often you can suggest, 'Why don't you keep it yourself?'

"If it is a refrigerator you can remind them of those times they wished they had more space to store extra food. Why not, then, put the old refrigerator that is still good, in the basement or on the back porch and use it for extra storage?

"In the case of vacuum cleaners, on which there is such a high saturation, and so much new merchandise available, it isn't necessary to take so many of the old ones in. If they have an upright type suggest they keep it for rugs but buy the tank type for so many other uses. Suggest that the old cleaner is just the thing for odd and dirty jobs, such as cleaning the basement, ashes from the fireplace or as a sawdust collector in the home workshop.

"There is even an opportunity, if you have a repair and service show, to suggest bringing it in to be cleaned, oiled, fitted with a new cord, new bag, fixed up for those odd jobs.

Each appliance has a similar angle.

The old one can be used for extra storage.

To Be Financially Successful—

Step up the Tempo

Ninth in a series by

KEN HAMPTON

The youngsters don't know what it does.

TWO factors are always working to keep the merchant alert if he is to succeed.

The first of these is the **changing living habits** or standards of his customers. The second is the development of **new materials** or application of old ones to meet the needs of customers.

An example of the first is the demand for vacuum cleaners that comes with the use of more carpeting in homes and business establishments. Another is what someone has said of so many of the newcomers who are settling on the Pacific Coast, they come "naked of possessions."

A good example of the second is the need for frozen food lockers and frozen food freezers that has come with the development of food freezing processes and the marketing of packaged frozen food.

The last rather normal retail selling year for the retail selling industry was 1941. Since then the young people who were just entering high school have grown up—been busy with a war—and are now married and establishing their homes.

During the war period they were not exposed to the merchandise selling processes of a normal market. Together with the newcomers to each community, they represent a new factor in the market. As such they need carefully planned **telling** about the dealer's store and his products.

Not only is this true but during the same period the electrical industry has perfected and is offering generally **many new products** such as the automatic clothes washer, clothes dryer, the waste disposal, the domestic dishwasher, frozen food storage cabinets, fluorescent lamps and others.

These products **are not well known** by either customers or sales people through use in their own or their parents' homes.

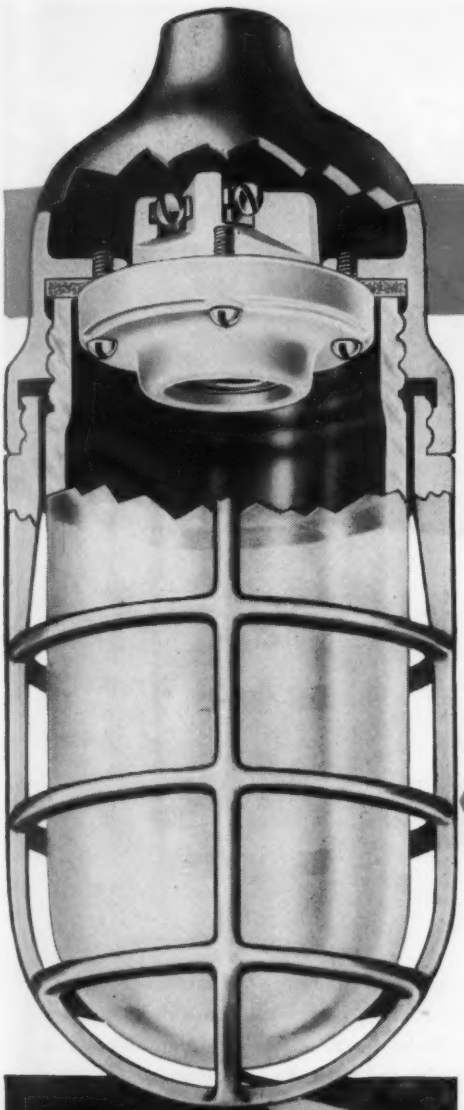
Such changes are far reaching. They require a new approach to retail selling from the electrical dealer. He now must not only offer his customers many new products, but he must offer the products he has long been selling **in a more convincing way.** He must do it in **shorter store hours.**

Sales people need to tell a **more thorough product story** because both products and customers are new acquaintances. The only answer is better training in selling and product for every member of the staff. They not only must know how to sell, they must know how to take **full advantage of displays, sales literature, demonstration materials,** etc., to speed up their sales presentation. Due to shortening of both store and working hours, **the sales presentation must be made faster and more convincing.**

The new dress for selling electric appliances is a complete and thorough sales story, quickly and effectively given to each customer.

If the order is not obtained on the first try, then the **customer should be cultivated** by telephone, direct mail, home visits, invitations to the store for demonstration. On all contacts he must receive information that will help him buy. If he doesn't get the full story to satisfy him from your store he may shop around until he gets it from other dealers—and one of them may close the sale.

The process of selling is often slow because of the education that needs to take place, but an interested shopper is soon some store's customer. Why shouldn't he or she be **yours?**



Vaportight
Industrial Lighting
CONDULET*

For use in boiler rooms, powerhouses, shower rooms, tunnels, loading docks, building entrances, and all indoor and outdoor locations where exposed to moisture and rain, non-explosive vapors and gases, or non-combustible dusts.

Vaportight and raintight.

Wiring chamber remains vaportight even though globe is off.

Porcelain Receptacle.

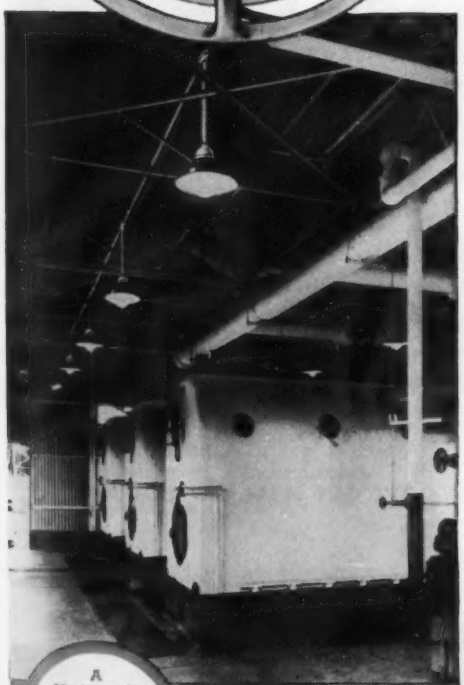
Screw guard or clamp guard.

11 Hub arrangements.

4 Reflector styles.

Accessories: Colored globes, pear-shaped globes and guards, half shades, and adapters.

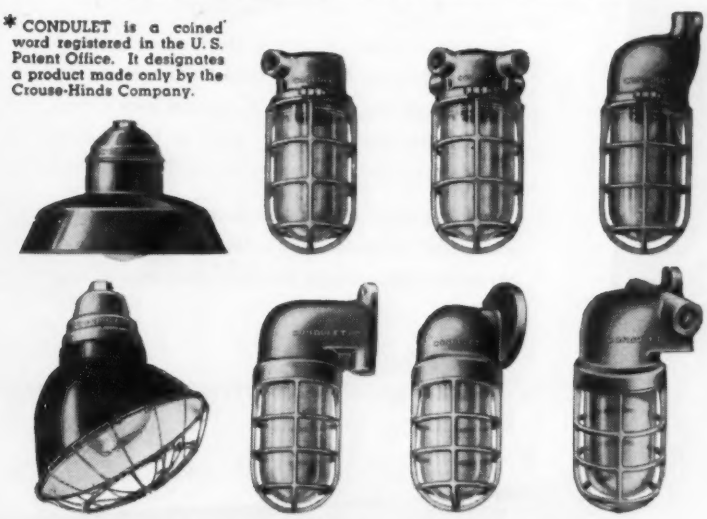
4 Sizes: 50 through 500-Watt.



Vaportight **lighting fixtures are available for attaching to several round-base Condulets and sheet steel outlet boxes. Crouse-Hinds complete *Vaportight* line includes hand lamps, switches, plug receptacles, and other electrical devices.**

Complete listings in Section 25, Condulet Catalog 2500.

* CONDULET is a coined word registered in the U. S. Patent Office. It designates a product made only by the Crouse-Hinds Company.



A Nationwide Distribution Through Electrical Wholesalers

CONDULETS
FLOODLIGHTS
TRAFFIC SIGNALS
AIRPORT LIGHTING

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

Offices: Birmingham – Boston – Buffalo – Chicago – Cincinnati – Cleveland – Dallas – Denver – Detroit Houston – Indianapolis – Kansas City – Los Angeles – Milwaukee – Minneapolis – New York Philadelphia – Pittsburgh – Portland, Ore. – San Francisco – Seattle – St. Louis – Washington.
Resident Representatives: Albany – Atlanta – Charlotte – New Orleans – Richmond, Va.
CROUSE-HINDS COMPANY OF CANADA, LTD., *Main Office and Plant:* TORONTO, ONT.

THEY'RE HERE! 3 GREAT

NEW BENDIX GYROMATIC

EXTRA!

Even puts in its own soap!

EXTRA!

The new Bendix Gyromatic needn't be fastened down!

Here's the almost-human Gyromatic . . . specially balanced, so it needn't be fastened down. Even when it's whirling at top damp-drying speed, you can balance a nickel on edge on its smooth, flat top. Show your customers how it can soap, soak, wash, triple-rinse and damp-dry . . . all by itself. Automatic soap injector is optional on the Bendix Gyromatic.

The hottest news since Bendix announced the first automatic washer!

Hold on to your hats, boys! Here come the *new* Bendix Washer Models! Better than ever—redesigned inside and out! The great new Gyromatic—the new DeLuxe—and a brand-new Standard model that features the "New Look!"

All three new Bendix models have new and exclusive features which lend themselves to arresting displays and dramatic demonstrations. All three offer improved "Tumble-Action" washing and stepped-up damp-drying results.

Yes, here are three new reasons why your store is local *headquarters* for the biggest values in home laundering equipment . . . backed by the stand-out advertising campaign in the washer industry. They're hot news to *everybody*. They will be profitable to you, if you start pitching now.

THE NEW BENDIX STORY IS A BIG PROFIT STORY! GET ABOARD TODAY!

NEW BENDIX WASHERS!

IMPROVED INSIDE AND OUT!

EXTRA!

Washes better—Improved "Tumble-Action!"

EXTRA!

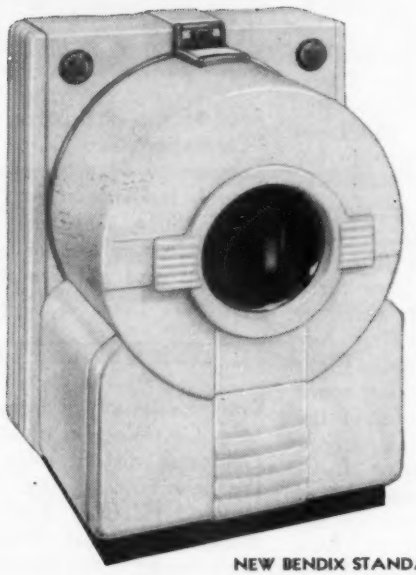
Damp-drys better—
Faster spin!

EXTRA!

More working surface!

NEW BENDIX DELUXE

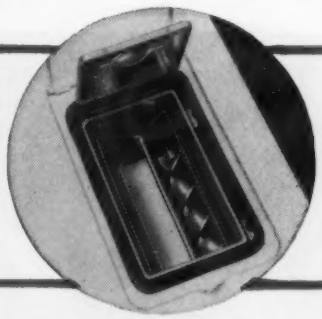
Presenting the all-new DeLuxe—with improved damp-drying, better washing, more working surface . . . a dream of a washer! Automatic soap injector optional.



NEW BENDIX STANDARD

The great new Standard! Features stepped-up washing, better damp-drying. More beautiful than ever—but still the bargain washer in the automatic field!

Here's that wonderful automatic soap injector! Load the soap bin—set the dials—and that's all! Every load of wash gets the exact amount of soap—no more—no less! The greatest single improvement in complete washing convenience since the first Bendix automatic Washer.



BENDIX HOME APPLIANCES, INC. SOUTH BEND, INDIANA

Also makers of the new Bendix automatic Dryer and the Bendix automatic Ironer.

BENDIX automatic Washer

Bigger, Better Supply House

As another step in its business expansion, the Westinghouse Electric Supply Co. moved April 5 to a new 40,000-sq.-ft., single-story office and warehouse building at 210 Rio Grande St., Salt Lake City, and turned over to the parent Westinghouse Electric Corp. its former building at 235 W. South Temple. John Longden, manager, and almost all of its 85 people put in long hours to make the transfer and be open for business on April 5 without interruption.

The new building has an auditorium which seats 100 in which most of its meetings for sales groups can be held. It may be used for other groups, such as electrical contractors, plumbers, home builders. There is a coffee shop and conference room on a mezzanine. The coffee shop serves employees free coffee and they may take their lunches there to eat. Fifteen-minute relief periods are provided in the morning for coffee.

The large warehouse has storage equipment of modern design, such as steel shelving, tables, motor lifts, etc. The warehouse is served from three carloading docks on a spur track at the rear and a truck-loading bay which will hold four trucks. Eight thousand square feet of parking space are provided at the south end of the building for customers.

The office area has 4,000 sq. ft. of space and is lighted by four rows of 4-lamp Westinghouse fixtures on the ceiling. An acoustical ceiling has been installed for noise reduction. The service counter faces Rio Grande St. adjacent to the office, with the warehouse area to the rear.

Staff at the WESCO Salt Lake City house consists of John Longden, manager; T. A. Maughan, apparatus and supplies sales manager; J. M. Hansen, merchandise sales manager; Henry Falkner, sales promotion and advertising manager; S. M. Lillie, stores manager; J. A. Marine, service manager; and M. F. Hansen, credit manager.

● CORY CORP. has added Lester M. Nielson to its commercial sales force. He will assist E. H. Sager in sales promotion and distribution of Cory commercial coffee brewing equipment on the West Coast. Nielson was for the last 12 years with Standard Brands.

● NEW HEADQUARTERS for the U. S. Grant Supply Co., Los Angeles, are at 200 E. Eleventh St., near the Furniture Mart.

Four of the distributors who moved in on San Diego dealers to general staff "Operation San Diego," the Proctor electric iron saturation test, with a barrage of advertising and promotion. J. McMahon, appliance sales manager, Gough Industries, Inc.; E. Bonnet, traffic appliance sales manager, Graybar; M. G. Sues, president, Sues, Young & Brown, and M. Katzev, sales manager, J. N. Ceazan Co., all of Los Angeles. The promotion sold more of all makes of irons and put Proctor in first place, whereas it had been trailing before

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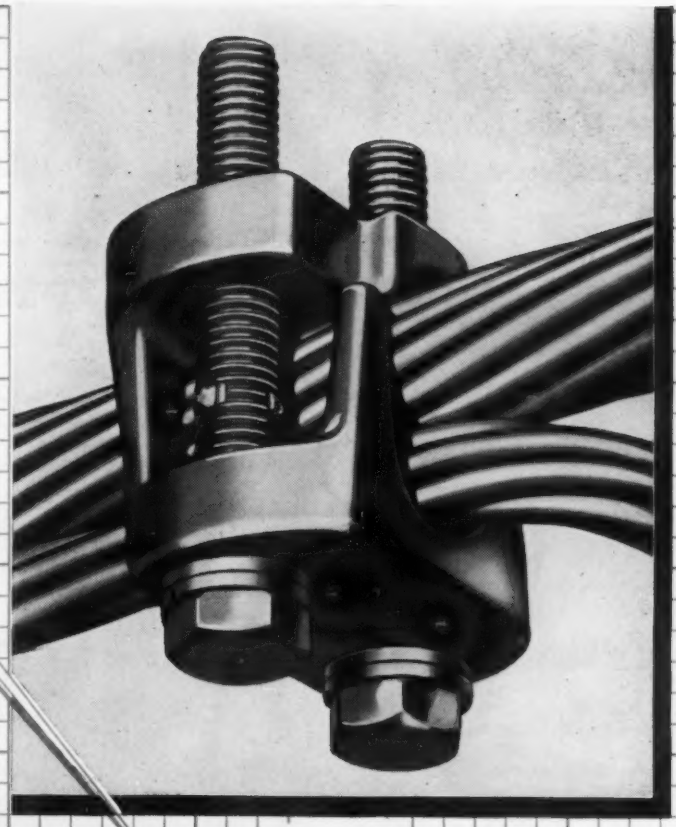
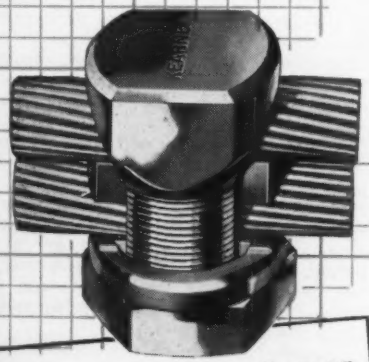
Every salesman an ironer in his own right, is what Lou Stull, Apex Electrical Mfg. Co. Western division sales manager, believes and he started his Northern California district sales managers on a training course to learn ironing with the new Fold-a-Matic Apex ironer. Mrs. Marion Biddle, home counselor, instructed H. Clay Smith, Sacramento; Ken Kennedy, metropolitan San Francisco; Art Ellwein, Oakland, and Harold E. Williams, Fresno, and required each to do a full basket of laundry. The folding ironer whose cabinet fits in with modern kitchen cabinets was introduced on the Pacific Coast in April after having been shown to dealers at last spring Market in the Apex Western office and showroom at Western Merchandise Mart, located in San Francisco



Use this

Kearney PRESSURITE Two-Bolt Clamp

for Connections in Highly Corrosive Atmospheres and Get Better Performance at Less Cost



Con-Nec-Tite with Spacer

Spacers for stranded conductors available in sizes from 2 stranded thru one thousand MCM.

Connections made in corrosive atmospheres require high pressures capable of breaking through the corrosive film on conductors. This is particularly necessary in cables of greater than seven strands where the inner strands cannot be cleaned mechanically.

The Pressurite Clamp has two high strength, fine pitch, threaded bolts that exert equalized high pressures on large size stranded cables.

Use them for the tough assignments where contaminated air and high short circuit values put heavy demands on connectors. Sizes 4/0 through 1000 MCM.

—o—

All Kearney Con-Nec-Tites in sizes #8 through #4/0 are now made from the new specific connector material, tough, high conductivity Kearnalloy, made to match post war improvements in power line construction.

Always Specify **KEARNEY PRODUCTS** *For the Job*

MAYDWELL & HARTZELL
INCORPORATED
LOS ANGELES • SAN FRANCISCO • PORTLAND • SEATTLE

APPLIANCE PREVIEW

Floor Polisher (540)

Beal Mfg. Co. is producing a vacuum cleaner attachment for polishing floors, table tops and automobiles. Called speed-polisher, the device provides a 7-in. circular bristle brush in horizontal rotary motion for initial polishing, and two sheepskin "bonnets," one for applying wax and one for buffing. Polishing equipment is mounted on precision ball bearings and requires no oiling. Of air turbine design, the polisher is powered from the pressure side of vacuum cleaners. It is attachable to any of the major brands of tank type cleaners, manufacturer says.

Casserole (541)

National Enameling and Stamping Co. has added an electric casserole, the Seventy-Fifteen Electric Ovenette. This model has a solid stainless steel cover and automatic thermostat and signal light; removable 6-qt. porcelain enamel cooking well, fully insulated with glass wool. Cord set, wire bake rack, recipe and instruction book are included.

Kitchen Clock (542)

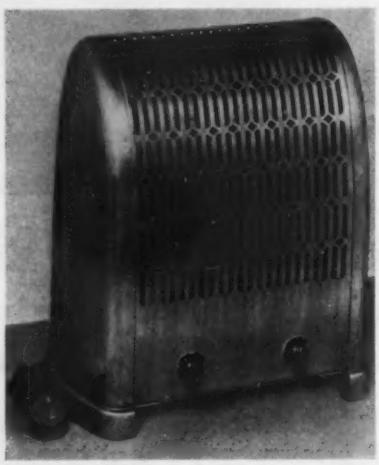
A small kitchen shelf clock for timing household jobs for periods up to 30 minutes has been announced by General Electric, under the name Little Chef.

Ventilator (543)

An easy means of removing ceiling grille for cleaning has been incorporated in new models of the Clipper home kitchen ventilator made by Trade-Wind Motorfans Inc. The new models are available with single and dual blowers with ratings from 1,500 to 2,500 c.f.m. On older models, two screws were removed for grille maintenance; on new models it is necessary only to loosen the screws.

Heaters (544)

Nine new electric home heaters are offered by Westinghouse. They include three 240-volt floor models with built-in Ajust-o-matic thermostat control, ranging in size from 2,000 to 4,000 watts; five 240-volt wall models with automatic control, ranging from 1,500 to 4,000 watts; one 120-volt wall model, 1,250 watts, designated as a bathroom heater.



Lighting Fixtures (545)

An addition to the Lightolier line of Colonial fixtures is the Salem, combination of brass and glass, featuring hand-blown, hand-cut hurricane chimneys and a body modeled after a whale-oil original. Matching wall brackets are available.

Clock (546)

Seth Thomas' Lustre clock is for modern rooms, comes with a crystal-clear plastic case, prism cut. It has a silver dial, with etched background. Numerals are black against a white numeral track. Sash and sweep hands are in lustrous silver.

Washer Line (547)

An automatic soap injector is optional equipment on two of three automatic washers added to the Bendix line. The new line, which supplements two postwar models, introduces the Bendix Gyromatic home washer for use in apartments and rented homes. It is specially balanced to eliminate need for fastening it to the floor, and is available with or without the automatic injector. Others in the new line are the deluxe, with or without automatic injector, and the standard model.

The automatic injector adds either soap or synthetic detergent in metered amounts predetermined by the operator. The device permits soaking and immediate washing without attendance.

The Gyromatic is vibrationless, according to the announcement, which states that the motion of the spinning mechanism is isolated from the cabinet by suspension springs and hydraulic shock-absorbers. For extraction periods, the cylinder spins at 525 r.p.m.

Trough-type, perforated baffles are incorporated in the tub for greater efficiency, particularly in hard-water areas. The timer provides a drain period, spray rinses and spin following the "soak" period, which is optional. Following the wash are a drain period, flush rinse and spin extraction, plus two deep rinses in fresh luke-warm water, each separated by a drain period and spin extraction.

Capacity is 9 lb. of dry clothes. Tumble action washing and rinsing are retained in the new models, as is the porthole door.

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THIS MONTH'S NEWS

Water Over the Dam

Take a second look at ELECTRICAL WEST's cover. When the picture was taken, more water was spilling through the valves in Shasta Dam than was going through the power house to operate the three 75,000-kw. generators. On April 16 release of water was begun so as to insure sufficient reservoir capacity for flood protection. During the first seven days 94,000 acre-ft. of water was thus wasted. If run through the generators, it would have produced 38,000,000 kwh. That's as much power as was saved by curtailment in northern and central California during February. All during March one generator in the power house remained idle because USBR officials contended the water would be needed for summer irrigation. Now the water is literally "going over the dam"—a black crime in any load dispatcher's book.

Controls End in California

Controls on new industrial loads. last remaining power restriction forced by water shortage in northern and central California, were suspended May 1 by the State Public Utilities Commission. Unusually heavy rains in March and April, deliveries of power from southern California and installation of new generating equipment were factors. Robert P. O'Brien, emergency power director, reported. He warned that summer power requirements may demand reinstatement of some or all restrictions. Daylight saving was retained.

Larger Atom Smasher for Berkeley

The Atomic Energy Commission last month announced that it would finance construction of a 110-ft. cyclotron, largest in the world, at the Radiation Laboratory on the U. C. campus at Berkeley. The new atom smasher will be 17 times as powerful as the lab's 184-in. model, currently the world's largest. It will acclerate protons and other atomic nuclei to speeds up to 6,000,000,000 electron volts and is expected to be completed in about five years; will cost $9,000,000.

Columbia Basin Has Plenty of Water

Columbia Basin's water supply this year will be adequate for all purposes, including electric power generation at Grand Coulee and Bonneville dams, according to a cooperative forecast by federal and Northwest state officials. An unusually heavy snowfall during March at high altitudes in Oregon and Idaho changed the picture from a deficiency to a fair supply. Based on snow surveys, the water supply varies from fair to good throughout the basin.

It is Merwin Project Now

In ceremonies honoring L. T. Merwin on May 1, Pacific Power & Light Co. renamed its Ariel hydroelectric plant the Merwin Project. The action was in tribute to the man whose vision helped make the project a reality.

B. C. Electric Dedicates Kidd Sub

Operation of B.C. Electric's Kidd substation was started April 7. The $1,000,000 station is connected to the Northwest Power Pool by a 230,000-volt line from Bonneville's Arlington substation. It also serves as a terminal link in the 30-mile B. C. Electric power ring around the Greater Vancouver area.

San Diego Report Features People

San Diego Gas & Electric Co., which last year won a national award for its annual report, has come up again with an outstanding job. A new feature is the prominence given to the people of San Diego County. Nine full-page photos depicting scenes from the city's industrial, commercial and cultural life have photo-inserts of a person identified with that phase, accompanied by comments as to why the particular person likes his city and why he intends to remain.

Aluminum Demand Still Growing

Approximately 800,000 kw. of Bonneville-Grand Coulee power is being consumed in aluminum potlines in the Pacific Northwest. And still aluminum demand continues to expand. Latest directive out of Washington, D. C., is for an immediate study of possible sources of more electric power for aluminum manufacture.

Sea Water Distillation

Interest in the possibilities of low-pressure, low temperature distillation of sea water as a source of future potable water for the Pacific Southwest continues to increase. Two of California's Congressmen—Fletcher and Johnson—are fostering legislation for a $30,000,000 experimental installation.

Calelectric Sells Yuma Property

Yuma, Arizona property of California Electric Power Co. has been purchased by Arizona Edison Co., which will serve the entire Yuma and Valley areas. Two companies serving in Yuma brought about wasteful duplication of lines and equipment, Reid Gardner, Arizona Edison president, said in a public letter to customers. Operating costs of both companies would have risen to the point where an increase in rates would have been inevitable, and officials of both companies worked to secure necessary approvals of governmental agencies. Rate schedules of the two companies were consolidated and a modest reduction was effected.

Hungry Horse Contract Let

Contract for construction of Hungry Horse Dam on the South Fork of the Flathead River, near Kalispell, Mont., was awarded April 21 to General Construction Co., of Seattle, Shea Co., Alhambra, Calif., and Morrison-Knudsen Co., Boise. The contract was in the amount of $43,431,000.

GAS FROM CABLE INSULATION EXPLODES IN SERVICE VAULT

Shortly before 11 p.m., October 31, an electrical short circuit and explosion occurred in the ... in the ... Build-

... compartment on th... ...nected to the 21st floor va...

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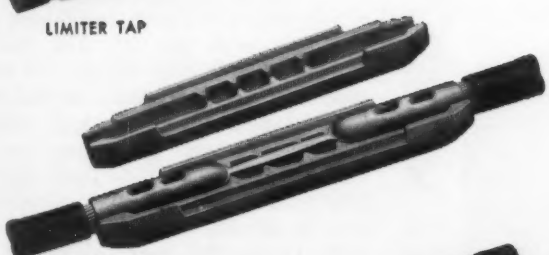

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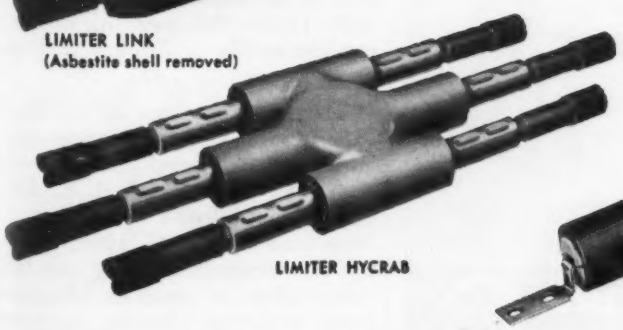

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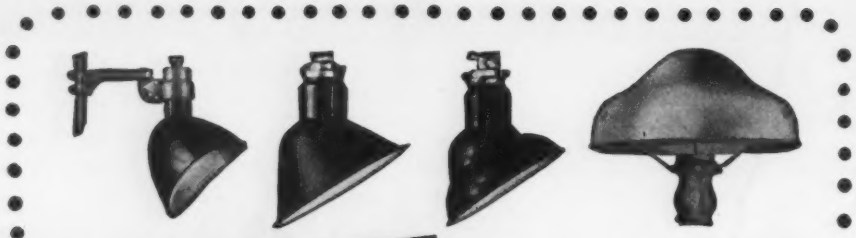

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THIS MONTH'S NEWS

Nevada Commission May Negotiate for Shasta Power

Nevada's Colorado River Commission hopes to act as a contracting agent in buying Shasta Dam power from USBR for distribution in the western and northern parts of the state.

Attempts to negotiate for the power at this time would be for relief of shortages that might occur within the next couple of years and would not affect the state's desire for a similar long-term contract.

Pacific Gas and Electric now sells power to the Sierra Pacific Power Co., whose system serves the area. Under the proposed contract the commission would buy the power from the bureau, arrange for delivery from PG and E, and in turn sell it to Sierra Pacific.

The long-term contract for Shasta power has recently been under discussion by Nevada and bureau officials. It would require the construction of a government-owned transmission line from Shasta to the California border.

Nevada's Colorado River Commission recently acted as contracting agent in taking over the operation of utilities for the town of Henderson from the War Assets Administration. This includes service to the nearby $140,000,000 Basic Magnesium Plant where several private industries have leased space.

● CITY of ANCHORAGE, Alaska, has purchased from the War Assets Administration for $25,000 the half of a ship which has been furnishing auxiliary power to the city. The *Sackette Harbor*, 16,000-ton tanker, broke in two, 500 miles off Adak in the Aleutian Islands. The after half, with a 4,500-kw. power generating station, was towed last year to Anchorage to help overcome a serious power shortage. It already has provided the city with 11,000,000 kwh. of power, according to Mayor Francis C. Bowden.

● BRITISH COLUMBIA is not likely to experience any power shortage, according to T. Ingledow, vice-president and chief engineer of B. C. Electric Co. Ltd. Ingledow said that plans have been laid until 1965, based on power consumptions over the last 50 years, plus an analysis of inquiries from industries planning to move to B. C.

The type of Simplex Self-Supporting Aerial Cable shown above consists of three separately insulated and jacketed conductors bound to a messenger wire by means of copper binding tape.

Each conductor is insulated with an adequate wall of the famous low-water absorption Simplex-Anhydrex insulation. This insulation is, in turn, protected by a thin jacket of specially compounded neoprene, which is highly resistant to sunlight and weather.

Simplex Self-Supporting Aerial Cable, as shown, is ideal for three phase power transmission. Similar cables designed for signaling, communication or supervisory control, are equally satisfactory. Installation costs are low and maintenance is reduced to a minimum.

Further information will be sent immediately upon request.

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GORGE DEVELOPMENT GIVEN GO AHEAD AT SEATTLE

The Seattle, Wash., Municipal Board of Public Works has approved the request of Lighting Superintendent E. R. Hoffman for an appropriation of $9,500,000 for a development program at City Light's Gorge hydroelectric plant. Work will begin immediately and continue over a period of at least three years.

Largest unit of the program calls for construction of an addition to the Gorge power house and installation of an additional 66,700-kva. generating unit and other equipment at an estimated cost of $4,314,505.

Other projects contemplated are:

Replacement of the timber crib diversion dam at Gorge Creek with a low, concrete dam, increasing the output of the Gorge power house three per cent by an increase in the head, $1,385,416.

Modernization of the Gorge plant's present equipment, $330,000.

Construction of a new 220-kv. switching station across the river from the present power house, $368,687.

Construction of a new 220-kv. transmission line to Seattle to replace the present 165-kv. line, $791,187.

Installation of a new penstock at the Gorge plant for the additional generator, $944,000.

Streamlining the 2-mile long, 20½-ft. tunnel leading from the diversion dam to the Gorge power house, $980,000.

Altering the tunnel's intake to increase its capacity, $341,000.

The timber crib diversion dam to be replaced was put in operation in 1924. The new low, concrete dam will be increased in height some day when construction far up the river is completed.

● An Additional 30,000 kw. will be added to the capacity of West Kootenay Power & Light Co.'s plant at Brilliant on the Kootenay River by installation of a third generator, bringing total output to 90,000 kw. Consolidated Mining & Smelting Co. has announced that the new generator is expected to be delivered in the fall of 1949, and to be in operation about three months later. Work on new power lines to accommodate the added load will begin shortly.

● Seattle City Light has awarded a $40,000 contract for the building of two 40-ft. boats to be used on the lake behind Ross Dam on the Skagit River. The craft will be used to clear debris from the waters and for other purposes.

Good weather for ducks...

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YEARS AGO, Anaconda developed Duraline*—a weatherproof of the URC type, with URC life, but with improved performance during emergency periods.

Duraline combines URC saturants and finishers with an *interlocked fibrous sheath* that effectively retards moisture penetration during long periods of wet weather. Outages caused by foreign objects across the lines are reduced to a minimum.

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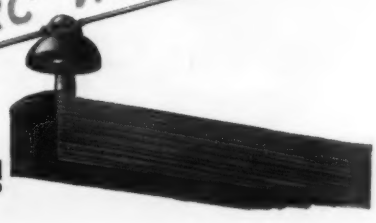

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A thermostatic switch equipped with silver contacts, carbon resistor and nichrome heater coil, bonded in a ceramic insulating material of high dielectric strength.

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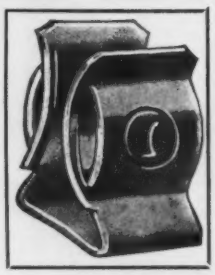

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HAWAIIAN ELECTRIC TELLS PLANS FOR EXPANSION

Hawaiian Electric Co., which has a physical plant valued at $39,000,000, proposes to spend more than $11,000,000 in expansion in the next three years.

Approximately $10,300,000 will go for boiler and turbine equipment, additional transmission lines and substations to accommodate the new loads expected in the next four years. The rest will go for miscellaneous building expansions and equipment purchases.

The biggest single item will be $6,300,000 for a new 40,000-kw. generator and plant at Hawaiian Electric's new Waiau plant, on the shores of Pearl Harbor.

The new generator—the company's No. 4 unit—will be an exact duplicate of one installed last year.

Construction of new transmission lines into the growing residential area on the so-called "windward side" of Oahu, across the mountains from Honolulu, will require $500,000.

About $3,500,000 will be spent on substations, line extensions, transformer vaults, additional meters and secondary system.

President Leslie A. Hicks says that past experience shows the company's generating facilities must be doubled every seven years.

The present program calls for spending $2,317,519 this year, $3,545,000 next year, and $5,275,000 in 1950.

USBR Lets Contracts for Coulee Dam Building

A $2,789,000 contract for construction of a control-bay building and other electrical work at Coulee Dam has been let by USBR. The new structure will house equipment essential to operating the east power house, where the first 108,000-kw. generator is scheduled for service in April 1949. The building will be 84 ft. high, 65 ft. wide, and 102 ft. long.

Also included in the contract were a switchyard, towers to carry power cables across the Columbia River below the dam, a tunnel for control cables, and several miscellaneous jobs related to the east power house.

The contract was awarded on a joint bid to Morrison-Knudsen Co. and Peter Kiewit Sons.

● A DICTIONARY of German electrical symbols originally published for U. S. military use, is available from the Office of Technical Services, Department of Commerce, Washington 25, D. C. Price is $3.

Only a Prosperous America Can Be Free

DURING May 50 million American workers will get from the Congress of the United States a real incentive to work.

This incentive is called a tax cut. Beginning May 1, the withholding tax on incomes will be reduced, giving everyone a much-needed increase in take-home pay.

But the tax cut will have a far more important effect. It may be literally a life-saver for American employment and production—and, hence, for the stability of the world. It will help to do two things which must be done if our economy is to continue to furnish good jobs and good earnings.

1. *It will generate part of the private funds for investment in common stocks—the "risk capital" which we need to sustain prosperity.*

2. *It will provide part of the incentives necessary to make American business management still more effective.*

These two predictions are not advanced as matters of opinion. They are based on facts reported by McGraw-Hill field editors.

These facts show why the reductions in upper bracket income tax rates are most significant for our continued prosperity. For the first time in more than twenty years the tax burden on people who can afford to risk their savings has been lightened. To find out what this will mean to the economy, McGraw-Hill field editors all over the nation asked a group of business executives making $15,000 a year or more how they will use the money which the tax cut gives them. Here is what they said:

1. They plan to save—not spend—three-fourths of the money they keep as a result of tax reduction.

2. They plan to invest one-half of these savings in common stocks. If all persons making over $15,000 follow this pattern, they will make available about a half billion dollars of risk capital for American industry.

WHAT THE TAX CUT WILL DO

What will upper bracket taxpayers do with their tax savings?
What can business expect as a result?

TO ANSWER THESE QUESTIONS, McGraw-Hill field editors interviewed a carefully selected sample of business executives earning $15,000 a year or more. Here, for the first time, are solid facts that show how tax reduction will effect the supply of risk capital and business incentives. These are the results:

1) How much of your tax reduction will you save?	74%
2) How much of your tax savings will you invest in common stocks?	52%
3) Will lower taxes lead you to switch some of your investment in bonds to stocks?	Yes 28%
4) Have you passed up an opportunity to invest in a new business in the last five years because the return after taxes did not justify the risk?	Yes 40%
5) Will lower taxes make you more inclined to take a risk on a new business?	Yes 80%
6) Have you turned down the opportunity to take a bigger job in the last five years because taxes would take too much of the additional income offered?	Yes 13%
7) Do you know of actual cases of executives who have turned down bigger jobs or more work because of taxes?	Yes 38%
8) Will lower taxes make you more inclined to take on a bigger job or more work?	Yes 59%

3. They also will switch some of their present savings from bonds and bank accounts to common stocks. This might easily add a billion dollars or more to the supply of risk capital.

The one-half billion dollars of tax savings and the funds switched from other investments into common stocks is not enough to end the shortage of risk capital. But it is a start.

Before passage of the tax law, risk capital had been growing increasingly scarce.

One measure of the scarcity is that last year only four-tenths of 1% of national income went into new common stocks. In 1925, a year of normal prosperity, almost 3% of national income was invested in new common stocks.

Another measure is that between 1940 and 1947 people actually reduced their holdings of corporate stocks and bonds by nearly a billion dollars. During the same period, people salted away almost $150 billion in such safe havens as cash, bank deposits, and government bonds.

This drought of risk capital hit us just when we need a vastly increased flow of risk capital to finance the expansion and improvement of our American productive machine. We need risk capital to search for new oil fields and to build new pipelines and refineries. We need capital to expand our over-loaded electric and gas utilities. We need it to finish re-equipping our airlines and railroads and bus lines. We need it to modernize our textile production. We need it to keep pace in the magical, booming chemical industries. We need it to launch the new industry of television.

We need capital for all this work and for much more besides. And we must do all this work if we are to keep the United States dynamic and if we are to create new and better jobs.

The tax cut comes just in time. As the last editorial in this series showed, the flow of risk capital must double or triple if we are to avoid a cutback in industrial expansion next year. A major reduction in industrial expansion because of a shortage of risk capital would menace our prosperity. Whenever capital expansion has sagged, the whole economy has sagged. That is the record. That is why every American has a crucial interest in breaking the shortage of risk capital.

The tax reduction now going into effect helps relieve that shortage. In my opinion, we need still other tax changes to assure enough risk capital for healthy industry and healthy employment.

We should encourage the rapid depreciation and replacement of plants and equipment to keep America efficient.

We should eliminate the double taxation of stockholders' incomes.

We should permit full averaging of good years and bad in calculating income tax payments.

We should cut tax rates again as soon as we can.

The tax cut of 1948 will prime the flow of capital. We must keep it flowing.

The tax cut also encourages our successful men and women to work harder and more effectively.

The McGraw-Hill editors collected some solid facts to show how seriously heavy taxes have discouraged business leaders. Here they are:

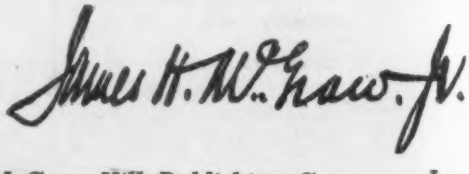
1. One out of seven persons the editors questioned said that they had turned down positions with greater responsibilities because heavy taxes would take most of the greater pay that went with the harder job.

2. Six out of ten executives would be more inclined to accept a more responsible job now that taxes will let them keep more of the added pay such a job would bring.

We all have a stake in incentives which make men work harder, especially talented men. The more we each work, the more we all have.

The tax reductions so far made will leave the government more than enough revenue to meet all its expenses, including the proposed defense expenses, and still reduce the national debt. If more defense money becomes necessary, vigorous economy on less essential government expenses will make possible both stronger military defenses and a better tax system. We need both.

Only a prosperous America can be strong enough to remain free—and to help keep the rest of the world free.



President, McGraw-Hill Publishing Company, Inc.

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MORRIS TAKES ISSUE WITH STATE ENGINEER ON WATER

Greater consideration should be given to the ever-growing demands for water and power in California communities, as well as to the agricultural demands for water, according to S. B. Morris, general manager and chief engineer of the Los Angeles Department of Water & Power. In a statement at the Fresno convention of the ASCE last month Morris took issue with State Engineer Edward Hyatt.

He urged the earliest possible construction of the Glenn Canyon and Bridge Canyon dams on the Colorado River where some 1,000,000 kw. of new hydro power could be produced. Energy from the Bridge-Glenn development would be the equivalent of burning 15,000,000 bbl. of fuel oil annually in steam-electric stations, he asserted.

Morris also asked for an early resolution of the differences existing between California and Arizona over division of the waters of the Colorado River. Arizona's proposal for the $738,000,000 Central Arizona project threatens the water resources already allocated to California. The rights of the two states can only be adjudicated in the U. S. Supreme Court, in his opinion, and he urged early passage of legislation which would settle the present acute controversy.

McNary Dam Bids To Cover First Major Construction

Bids will be opened about June 22 on the first major construction contract for McNary Dam, third power, irrigation and navigation development on the Columbia River.

Almost half of the $230,000,000 estimated total cost of the dam, or $112,000,000, will go for the power house and its facilities. A large portion of the remaining half will be spent for navigation locks, relocation of railroads and highways, raising of bridges and construction of levees.

Work under the contract will include construction of a major part of the navigation lock, abutment embankment, fishways, a part of the spillway dam and appurtenant structures. Completion of the work will be required by June 30, 1950. Features for the proposed public highway and bridge across the lock approach will not be included in this contract.

Approximately $7,500,000 has been spent thus far in construction for the fiscal years 1947-1948. Building of the steel cells for the cofferdam, which are 38 ft. in diameter and 28 ft. in average length, together with excavation for locks on the Washington side of the Columbia, will complete the first stage of construction.

At present 140 engineers are being employed by the corps of engineers for work on the dam. At the peak of construction the number will be increased to approximately 230.

Pacific Builds Substation To Serve McNary Dam Workers

In preparation for the influx of workers to McNary City, construction camp at the site of McNary Dam on the Columbia River, Pacific Power & Light Co. has built a substation at Hermiston, Ore. The company temporarily installed a 1,000-kva. transformer at the new substation, and built a by-pass line around Hermiston to give the Umatilla-Echo-Stanfield area a feeder service independent of the Hermiston feeder.

Distribution lines in the area are being reinsulated in preparation for the arrival of a 2,000-kva. transformer, which will permit raising voltage from the present 7,200 volts to 12 kv., tripling the carrying capacity of the feeder.

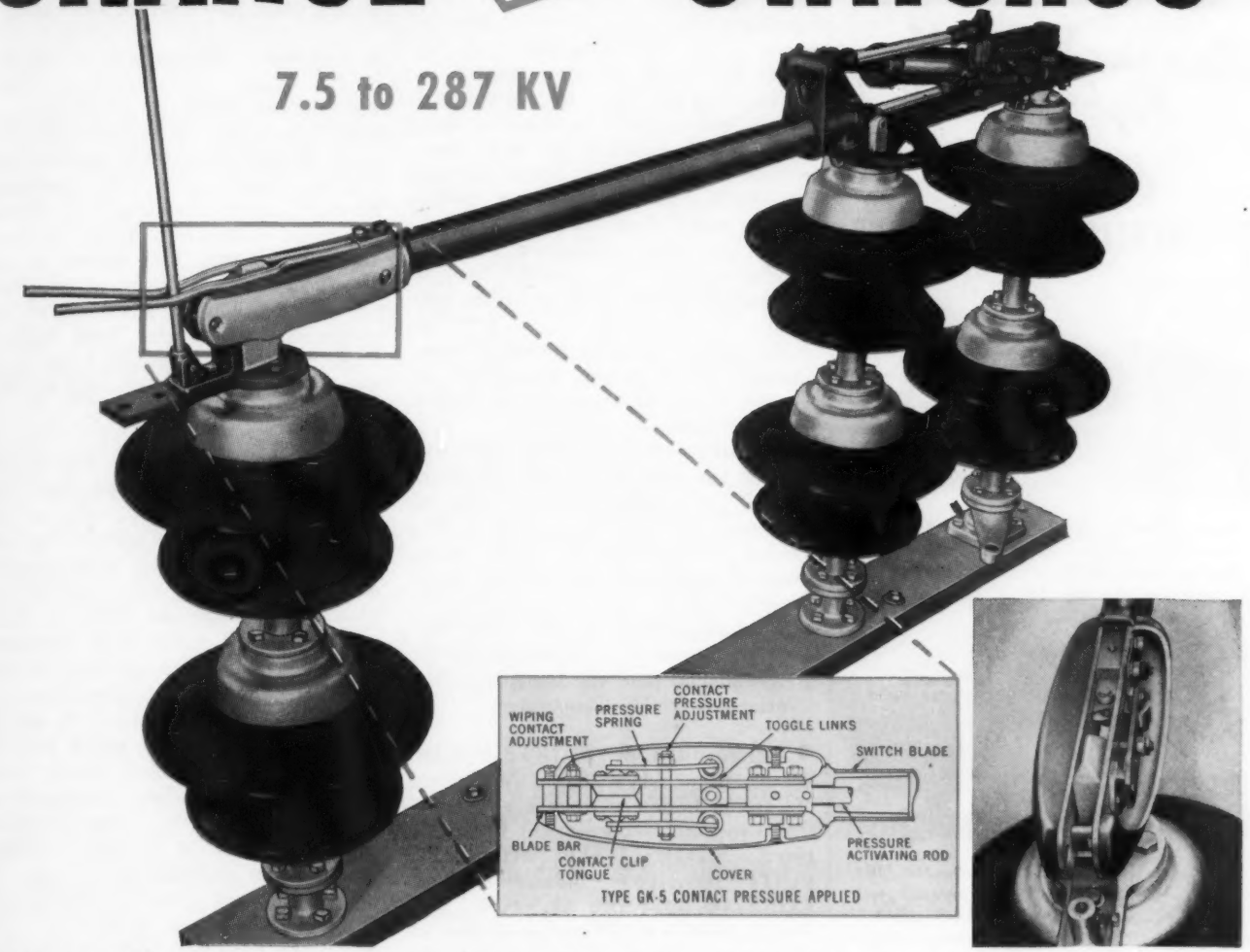
After the lines serving Umatilla, Echo and Stanfield and the rural areas around them have been placed in operation, the primary distribution lines serving Hermiston will be reinsulated and cut over.

● AN AGREEMENT has been recorded at Oregon City, Ore., permitting the Hawley Pulp & Paper Co. to exercise renewal options on leases of water power rights and lands owned by the Portland General Electric Co. at or near Willamette Falls. The leases, due to expire Dec. 31, 1954, will be renewed to Dec. 31, 2004. Under the agreement the paper company agrees to buy all its electric power, except that generated in its own plants, from PGE. This agreement was filed as ownership of the Hawley mill passed to the Publishers Paper Co., headed by officers of the Los Angeles Times and the Deseret News of Salt Lake City, Utah.

● SOUTHERN COLORADO POWER Co. has decided to discontinue publishing its employee house magazine, *Hotwire*, at least temporarily. After quizzing its employees on the value of its lithographed paper, the suggestions and criticisms indicated that a more costly form of publication was sought, and because of rising costs the project was deferred. E. H. Pemberton, sales manager, had been its editor, with a volunteer staff of contributors.

CHANCE GK-5 Switches*

7.5 to 287 KV



Long Life, High Pressure Area Contacts wipe clean without abrasion

CHANCE GK-5 Switches are fulfilling many big assignments on voltages up to and including 287 KV. They are performing with precision under widely varied climatic conditions. Designed by engineers who are experts on power switching operations—men who have many "firsts" to their credit for solving major switching problems—these switches are now available from coast to coast.

All details of the control mechanism of GK-5 switches have been designed to give years of smooth, dependable performance without field maintenance. Oilite bearings are used throughout . . . Switches for 69 KV and above have switch blade counter-balancing mechanism for easy gang operation . . . High pressure contacts are obtained by a simple toggle device.

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● **GENTLE WIPING CLEANS CONTACTS.** The blade and clip contacts engage under moderate pressure during the blade movement. This wiping action cleans silver surfaces *without abrasion.*

● **HIGH PRESSURE AFTER CLOSING.** High pressure is applied after switch blade has completely closed. Pressure is released before blade travel starts, minimum contact resistance is obtained without surface abrasion, insuring long contact life.

Diagram and cutaway photo show the contact mechanism of the GK-5. After closing motion is completed, control rod, actuated by a cam, causes toggle links to press against leaf springs which set the high pressure between contact surfaces.

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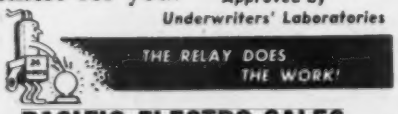

PACIFIC ELECTRO SALES

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COOPERATIVE PLANNED FOR NEW MEXICO COMMUNITY

Plans have been made to organize the Jemez Mountain Cooperative to construct electric distribution lines to serve about ten communities in the Jemez Mountains of New Mexico.

Plans call for the cooperative to ask a REA loan to build distribution lines. Communities which it plans to serve include La Jara, Cuba, Jemez Springs, San Ysidro, Lower Vallecitos, Sulfur Springs and Cebolla Canyon.

The proposed cooperative plans to purchase power from existing private companies, rather than set up its own plant.

No estimate as to the length of lines, number of expected customers or amount of the REA loan to be needed has been made as yet.

The proposed cooperative will serve part of the area which the old Continental Divide Electric Co-op planned to serve. The old organization disbanded without constructing any lines. Present plans call for admission to membership in the new cooperative without payment of the usual membership fee, some 400 residents of the area who had paid the fee to join the Continental Divide Cooperative.

● BENTON County PUD of Prosser, Wash., has sold $225,000 in general obligation bonds to finance an expansion program, according to Owen W. Hurd, manager. This brings the PUD's bonded indebtedness to $2,075,000, of which $1,550,000 was issued when it took over properties of Pacific Power & Light Co. in the county. A $300,000 revenue bond issue was sold Jan. 15. General obligation bonds rather than revenue bonds were sold this time because of the lower interest rate, Hurd said.

● CALIFORNIA ELECTRIC POWER has asked FPC authority for promissory notes in the amount of $7,000,000. The notes would be issued under a loan agreement between the power company and Bank of America National Trust & Savings Assn. They would be issued from time to time until Dec. 31, 1949 and bear 2¼% interest annually, plus a commitment fee of one-fourth of one per cent on the amount made available and remaining unborrowed.

● SIERRA PACIFIC POWER Co., Reno, Nev., has asked FPC authorization for $3,500,000 of first mortgage bonds, to be dated April 1, 1948, due April 1, 1978.

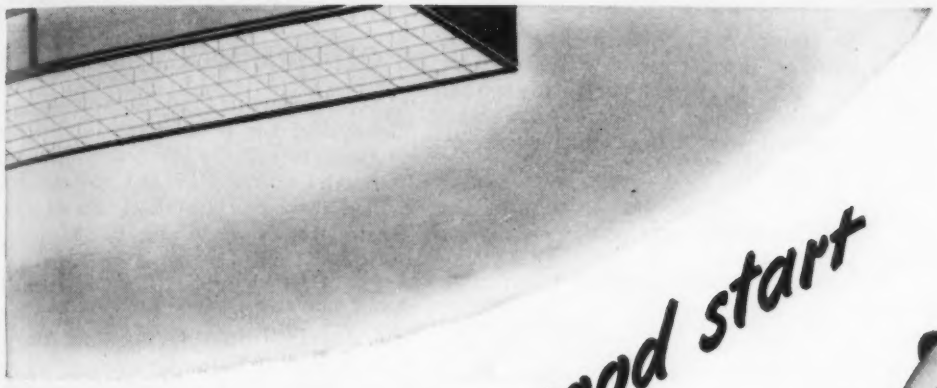
● IDAHO POWER Co. has applied to FPC for authorization to issue up to $10,000,000 of first mortgage bonds, due 1978, up to 150,000 shares of common stock of $20 per share par value, and short-term bank borrowings aggregating $2,500,000. The bonds would carry an interest rate of 3%.

● CANADIAN development of the Columbia River was started in March with the awarding of a $25,405 contract for foundation investigation work at the Wardner, Plumbob and Torrent damsites on the Kootenay River, Columbia tributary, in British Columbia to Western Water Wells of Calgary, Alberta. This survey is part of an international project to utilize the entire Columbia River system for power, irrigation and flood control. Preliminary investigation of the upper Kootenay was done by federal water power engineers.

● IN LOS ANGELES, the last of 332 new mercury vapor lamps have been installed on Broadway, one of the city's most heavily traveled streets. The new lamps, which were installed at a cost of $98,785, required replacement of 166 old cast-iron shafts and arms with rolled steel, necessary to hold the pendant or hanging-type lamps. Until last week, Broadway was the only street in the city with the old upright magnetite arcs, which were installed in 1919, and which were doomed recently when manufacturers discontinued making parts for them. According to Street Lighting Engineer W. E. Lauer, maintenance of the 332 lamps will be cheaper despite each one's 16,000-lumen brilliance. They will make Broadway's street lights the brightest in the nation except for those on one street in Niagara Falls, N. Y., Lauer said.

● CAFES AND BARS in Santa Monica, Calif., will soon be operating under new minimum lighting requirements under a city ordinance passed in mid-March. The ordinance requires a minimum of 1 ft.-candle intensity in places where food and liquor are served. Where food is prepared or dishes washed, the ordinance stipulates a 10-ft.-candle intensity. Civic and church groups, which promoted passage of the new ordinance, showed in a recent survey that only two out of 40 establishments in Santa Monica were up to these specifications.

● FPC HEARING on consolidated proceedings involving applications for development in the Kings River Basin, Calif., were scheduled to open May 17 in Fresno. Applications have been filed by the Fresno Irrigation District, Pacific Gas and Electric Co. and Francis N. Dlouhy of Los Angeles.



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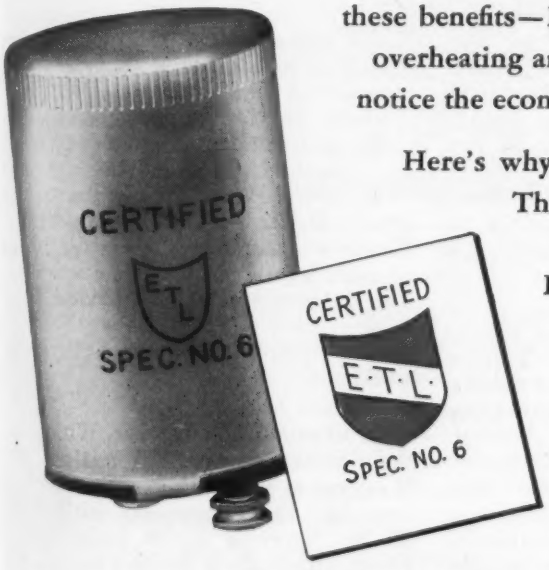

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The Lloyd Products Co., Providence, R. I.
Pass & Seymour Co., Syracuse, N. Y.
Sheldon Electric Co., Irvington, N. J.

KWH USE FOR HEATING COMPARED IN SURVEY

Individual room heaters use less current than central furnaces, rate engineers of Portland General Electric Co. report after a series of tests made since the fall of 1945 on electrical house heating installations in areas served by the company in the Pacific Northwest.

Because of insulation and other factors, a wide divergence was found to exist in energy use for heating. Houses using room heaters varied from 1,777 to 1,109 kwh. a year per cu. ft., while houses using central furnaces varied from 2,087 to 1,278 kwh. per cu. ft. The average annual energy use for all houses under the test was 1,293 kwh. per cu. ft. of building for room heaters and 1,616 kwh. per cu. ft. for houses heated by central furnaces.

While admitting that there is some loss of heat from hot air ducts of a central furnace, the engineers attributed lower energy consumption by room heaters chiefly to the fact that customers using room heaters are inclined to maintain comfortable temperatures only in rooms most used, while with central furnaces the tendency is to maintain an even temperature throughout the house.

Results of the tests, made by W. L. Sharp, chief test engineer of PGE, and A. E. Opdenweyer, were reported to Portland section, American Institute of Electrical Engineers.

Ranch-Type Homes Bring Troubles for Inspectors

With the modern tendency towards low-type ranch homes, a problem has arisen in Canada in connection with the extension of electrical service cables to such dwellings. These overhead loads, under the Canadian Electrical Code, must have a minimum overhead clearance, and many of the houses now erected are not sufficiently high to provide these clearances unless special structures are superimposed on top of the homes.

L. Robson, assistant inspector of Electrical Energy for the Province of British Columbia, states that in view of the requirements of rule 402 of the Canadian Electrical Code in regard to a minimum of 9-ft. clearance above the sidewalk, the department has no alternative but to enforce this regulation. This is a special exception made in the case of low buildings, as otherwise the Electrical Code requires that the consumer's service conduit fitting shall be installed in the location to provide that the load in cables be not less than 15 ft. and not more than 15 ft. above the sidewalk or ground level. In the case where leadin cables are installed at less than 15 ft., special permission must be secured, but in no case will less than a 9-ft. clearance be allowed.

Northwest Association Moves Research Service

Northwest Electric Light & Power Assn. has brought its Research Advisory Service from Spokane to Portland, and combined it with the Portland office of the association in new quarters at 204 Corbett Bldg., it was announced by Berkeley Snow, executive secretary. Ladner V. Ross, director of Research Advisory Service since its inception in the Northwest, has moved to Portland and continues to direct the service with a new staff recruited from Portland people.

Research Advisory Service is offered to the utility company members of the association who make it available to their industrial and business customers to answer questions in production, processing, marketing, packaging, and the like. Problems are sent through the utility companies to the central office in Portland, which seeks answers from appropriate research laboratories, colleges, trade associations, government organizations, and other institutions with which contact is maintained for this purpose.

Berkeley Snow, formerly with Pacific Power & Light Co., later with ELECTRICAL WEST, has been executive secretary of the association since 1932. Ladner Ross has spent the last 22 years in Spokane as illuminating engineer and later manager of industrial development of Washington Water Power Co., until he was asked by the association to take over Research Advisory Service in 1946.

● PENDING CHANGES in the present financial position of the Salt River Valley Water Users Assn., the association and members of the International Brotherhood of Electrical Workers have agreed to continue their present contract. Both sides agreed that, should rains fill association reservoirs or the associations financial status improve in any manner, wage negotiations will be reopened. The union has asked for an increase of 22 cents an hour across the board. The appeal, filed in February, was rejected by the association on grounds the increase was prohibitive because drought conditions have magnified generating costs. The union filed a 30-day strike notice which led to calling in a federal conciliator.

REHEARING DENIED IN STOCK TRANSFER PLAN

Application of Washington Water Power Co. for reconsideration of its proposal to acquire the common stock of Pacific Power & Light Co. has been denied by Andrew J. Zimmerman, Washington state director of public utilities.

The original application was turned down by Zimmerman in March after long hearings. It provided that American Power & Light Co., which owns the common stock of both companies, would donate its Pacific stock to Washington Water Power.

The new application "failed to furnish a definite and complete plan for the disposition of the common capital stock of these utility companies," Zimmerman said. The company may file a new application when a complete plan is formulated, he ruled.

IBEW International Officers Take Over in Seattle Dispute

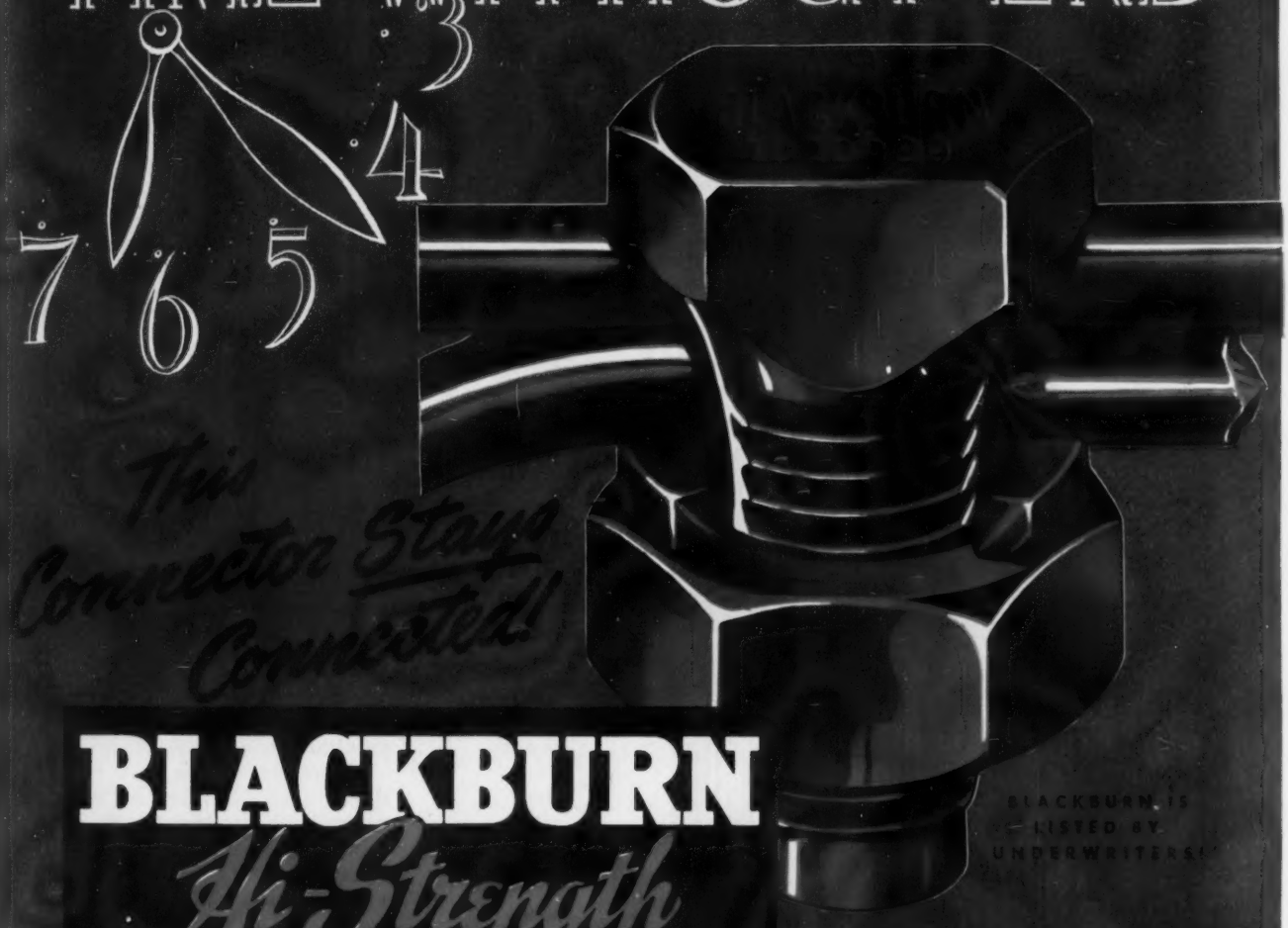
International officers of the International Brotherhood of Electrical Workers, AFL, have taken over administration of Local No. 77 at Seattle, Wash., composed of 5,500 linemen, cable splicers, maintenance men and others throughout Washington state.

Henry W. Newcombe, international representative of the union from the North district, acting for the international, requested and received the resignations of the local's officers but reappointed some of them.

There has been dissension in the union since outdoor workers conducted an unauthorized strike against the Puget Sound Power & Light Co., when union officials declined to support the demands of outdoor workers for higher wage increases than other workers. The outdoor workers contended they were entitled to more money because of the hazards encountered in their work.

● A HEARING at Wenatchee, Wash., by the Chelan County PUD against the Washington Water Power Co. of Spokane has been postponed until June 28 by Superior Court Judge Fred Kemp. Originally scheduled for March 29, it was to determine whether a certificate of necessity for condemnation of Washington Water Power property in the county should be issued. Washington Water Power attorneys asked for more time to prepare their case and the PUD agreed. No attempt to determine actual values of property involved was included in the hearings scheduled.

TIME WITHOUT END



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NEWS ABOUT PEOPLE

PG and E Announces Executive Appointments

Appointment of vice-presidents L. Harold Anderson and Norman R. Sutherland to newly created positions as assistant general managers of Pacific Gas and Electric Co. was announced by James B. Black, president. They will be executive assistants to William G. B. Euler, vice-president and general manager.

Doerr

Black also announced that O. R. Doerr, PG and E sales manager for the past ten years, was appointed vice-president in charge of sales to fill a post vacated by Sutherland.

Anderson, a former president of the California Public Utilities Commission, has been a vice-president of PG and E since August 1946.

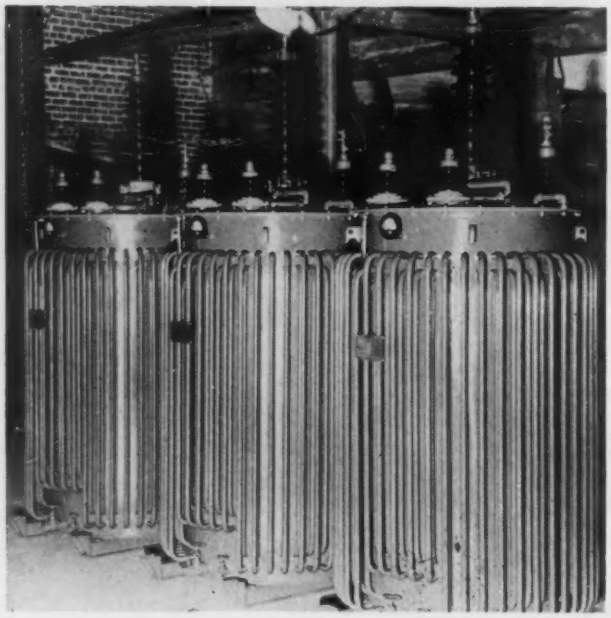
Sutherland, formerly manager of the company's San Francisco division, was vice-president in charge of sales and public relations prior to the new appointment.

Doerr started his career in the industry in 1921 when he resigned his commission in the U. S. Navy and joined the sales department of the Great Western Power Co. in Oakland, a corporation which merged with PG and E in 1930.

● JOSEPH M. SMITH, since 1945 manager of lighting division of the Federal Electric Co. Inc., Chicago, has announced his resignation from that company. He will remain in the fluorescent lighting field, transferring his activities to southern California with headquarters in Los Angeles, where he will represent a group of leading manufacturers of lamp and electrical equipment and serve as a technical consultant on lighting problems.

● H. F. HILBERT, manager of refrigerator specialties department, Westinghouse, East Springfield, was featured speaker at the Refrigeration Equipment Manufacturers Assn. meeting held at the Palace Hotel, San Francisco, on April 30, May 1 and 2.

● WILLIAM D. NESBEITT has been appointed manager of Allis-Chalmers' Spokane district office. Nesbeitt joined the company in 1946. He succeeds A. R. Kohlmetz who will remain in the Spokane office as a special representative.



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SCHENECTADY

SCHENECTADY VARNISH COMPANY, Inc.

Schenectady 1, New York

Davis

● RETIREMENT OF E. R. DAVIS as vice-president of the Southern California Edison Co., Los Angeles, was announced on April 16 at the annual stockholders' meeting in the Edison auditorium. He retired after 52 years in the electrical industry and the longest period of service of any member of the Edison company. Davis began his electrical career with the San Bernardino Electric Co., and in 1917 joined the Southern California Edison Co. as superintendent of the northern division, with offices in the Los Angeles general office. He was made assistant general manager in 1932 and elected vice-president in 1945.

● DIRECTORS of the Southern California Edison Co., Los Angeles, have elected HAROLD QUINTON to serve as executive vice-president. He has been vice-president of the company since 1942. The board also elected BRUCE RENWICK, formerly assistant general counsel, to the office of general counsel and assistant secretary.

Quinton

● CARL LACHENMAYER, general sales manager of the Auth Electric Co. of New York, recently made his first business trip to the West Coast. George Magnes of Agencies Co., southern California representatives, was showing him the lay of the land.

● CLARK BAKER, former manager of Westinghouse Electric Supply Corp. in Sacramento, has joined Wismer and Becker.

Young

● WALKER R. YOUNG, chief engineer, USBR, Denver, will retire June 30, after 37 years of service, and will be succeeded by L. N. MCCLELLAN, now assistant chief engineer. Young began service with USBR on construction of Arrowrock Dam in Idaho, later was associated with Hoover Dam and power plant, Central Valley project, and other power and irrigation developments in the West.

● JOHN H. CARKIN has been appointed Oregon public utilities commissioner, succeeding GEORGE FLAGG, who resigned to become a candidate for the Republican nomination for secretary of state. Carkin advances from the position of superintendent of rail transportation in the commissioner's office. Previously he had served as a member of the state legislature, speaker of the house, state tax commissioner and consultant to legislative tax committees. Flagg resigned after Governor J. H. Hall had announced that he would ask the resignation of any appointive paid official responsible to him who became a candidate for any elective office.

● DAVID M. SALSBURY, formerly on the West Coast, has been elected president of Westinghouse Electric Supply Co. Starting his career in Calgary, Canada, in 1915 with the Northern Electric Co., he later joined the Electric Railway and Manufacturers' Supply Co. of San Francisco, which was acquired by WESCO. In 1933 Salsbury became manager of the Supply Co.'s Salt Lake City branch. He was named North Pacific district manager in 1939 with offices in Seattle. Four years later he transferred to the New York office as general manager of the company. He has been executive vice-president of WESCO since 1946.

● ARTHUR YOUNG is the new district manager for Bandoli-McIntyre Co. in the Santa Barbara, Bakersfield and Valley territories, according to Marvin S. Bandoli, president of the company.

● ART WHITE, Sacramento representative for the Edward F. Hale Co., has been promoted to San Francisco manager of the Filter Queen division of the Hale Co. Prior to his association with the Hale firm, White was with the Sacramento Municipal Utility District.

McClellan

● F. HARVEY SEARIGHT, for 37 years associated with Allis-Chalmers on the West Coast, retired recently according to an announcement made by J. L. Singleton, vice-president and director of sales of the company's general machinery division. Joining Allis-Chalmers in 1911, Searight served successively as sales representative, assistant manager, manager of the company's San Francisco district office, and for the last nine months as Pacific region sawmill specialist.

● GEORGE BARR, consultant for the federal and marine division of General Electric's apparatus department in San Francisco, recently received the U. S. Navy's "Certificate of Commendation" for service while acting as service and installation engineer in the West Coast offices of the company.

● BRANCH OFFICE of B. C. Electric has been opened at Langley Priarie, B. C., with Dave King in charge. W. A. Lower will be district representative.

Discarded

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belong in the cellar

...but not

CIRCUIT PROTECTION

The cellar's a good place for a furnace—and for storing furniture, preserves, and last summer's hammock — but not the best place for circuit protection devices. Today's architects and electrical contractors prefer installing protection on the same floor as the loads. Simple, safe, good-looking Federal NOARK Multi-Breakers are placed where they're accessible *instantly* for instant restoration of light or appliance circuits. A full range of ampere ratings is available for indoor and outdoor applications.

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NEW! TYPE MO-4 MAGNETIC THERMAL MULTI-BREAKER

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NOARK *Multi-breakers*

Executive Offices: 50 Paris Street, Newark 5, N. J. Plants: Hartford, Conn., Newark, N. J., St. Louis, Mo., Long Island City, N. Y.

Federal Electric Products Company, Manufacturers of a Complete Line of Electrical Products including Motor Controls • Safety Switches • Service Equipment Circuit Breakers • Panelboards • Switchboards • Bus Duct

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Salesmen and manufacturers representatives have rare opportunity in line of Fluorescent Lighting Fixtures—easy to sell to wholesalers because it's UP in design and quality of construction and DOWN in cost of manufacture. Choice territories. Write experience or facilities in full.
William Ranieri, President
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1639 South Broad St., Philadelphia 48, Pa.

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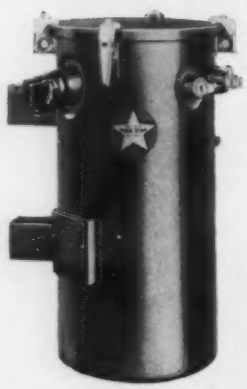

A new line of wound core distribution transformers made in sizes 25 KVA and below, 14400 volts and below, single phase, sixty cycles, OISC, conforming to EEI-NEMA standards.

A PENNSYLVANIA TRANSFORMER TO MEET ALL INDUSTRIAL OR PUBLIC SERVICE REQUIREMENTS

POWER	DISTRIBUTION
667 to 50,000 Kva.	3 to 500 Kva.
Up to 165,000 volts	Up to 46,000 volts

ASKAREL FURNACE — Up to 20,000 Kva.
DRY TYPE NETWORK UNIT SUBSTATION — Askarel—Dry Type—Oil Filled

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SUtter 1-7352
420 MARKET ST. SAN FRANCISCO

The late Ed Conroy, when he received barbecue set from San Francisco Electrical Contractors Assn. at end of term as vice-president. Seated is Tom Harris, president, also honored at that meeting at end of his term of office

● EDWARD V. CONROY, San Francisco electrical contractor, partner in the firm of Weber & Conroy, died April 7. Mr. Conroy had but recently withdrawn from the vice-presidency of the San Francisco Electrical Contractors Assn. because of ill health. He was vice-president and acting president last year and retained the position of governor of the San Francisco Chapter, NECA. For many years he was a manager for the Collonan Electric Co., a pioneer electrical firm in San Francisco. On the death of Con Collonan, Conroy and Weber, both members of the firm, went together in a new partnership.

● CLIFFORD PRUD'HOMME, Sacramento city chief electrician, died of heart attack April 12. Because of ill health he had taken a leave of absence for the past several months. He started as an electrical wireman, became an electrical contractor and in 1936 on the death of Carl Beaton was made city electrical inspector. In 1941 and 1942 he was president of the Southwestern Section, International Association of Electrical Inspectors.

● EDWARD N. GREENLEAF, former Los Angeles district office manager for the Allis-Chalmers Mfg. Co., died April 10 at the age of 73. He joined Allis-Chalmers in 1912 as a sales representative in the company's Salt Lake City office. In 1921 he was transferred to the Los Angeles office as manager, a post he held for 14 years. He retired from the company in 1947.

● FRANKLIN E. BLAUSEY, 72, retired superintendent of distribution for the Southern California Edison Co., died March 31 at his home in Redondo Beach, Calif.

NOTES ON THE TRADE

●A TWELVE-MONTH guarantee on all parts of its lighting fixtures where large installations are made was announced by Sylvania Electric Products Inc. It is the first such offer in the industry. It applies on orders of 100 or more fluorescent fixtures in a single location, and covers lamps, starters, ballasts, lampholders, reflectors, glass shields and metal parts. Any part that becomes defective within a year will be exchanged for a new part.

● N. V. ARNTZEN, southern district manager for Hubbard & Co., has established an office at Commercial Exchange Bldg., Room 522, 416 8th St., Los Angeles 14.

● RIVES MATTHEWS of W. N. Matthews Corp. has been elected vice-president in charge of sales. He has traveled extensively in the West since he joined his father, Claude L. Matthews, in the corporation in 1946.

● MCALPHINE ELECTRIC Ltd., Chilliwack, B. C., has moved into its new premises at 147 Yale Rd. The company is offering complete sales and service facilities for electrical appliances, radios and records. The service department is under the direction of Len Carey. The business is owned by Gordon McAlpine.

● APPOINTMENT of Arnspiger & Ostler Inc. as the United States Television Mfg. Corp.'s distributor in Salt Lake City, has been announced by Hamilton Hoge, president of UST. The Salt Lake City firm is located at 276 W. First South St.

● CHISHOLM INDUSTRIES Ltd. is extending its plant at 4515 Main St., Vancouver, B. C., following receipt of a contract from Simpson's Ltd. for production of radios.

● RUSSELL MACK has taken over Hardy's Radio and Appliance at W. 57th Ave. and E. Blvd., Vancouver, B. C.

● HARVEY MCROBERTS has moved his radio and appliance business from West Broadway to a new location at Fourth Ave. and Vine St., Vancouver, B. C.

● NEW ADDRESS of the Electric Service, Boise, is 826 Idaho St. The store was formerly located at 205 N. Ninth St.

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ELECTRIC EQUIPMENT CO.
ROCHESTER 1, N. Y.

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CONNECTICUT TELEPHONE & ELECTRIC DIVISION
Hospital Signal Systems — Annunciators — Intercommunication equipment, etc.
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Remote Control Equipment — Switches — Relays—Thermostats
HAZARD-OKONITE COMPANY
Copperweld, Bronze, Copper, Telephone Wire Division
TRICO FUSE MFG. CO.
Fuses, Oilers, Clip Locks and Fuse Pullers
BURKE ELECTRIC COMPANY
Bakelite Controlead Terminal Blocks

● THINWALL CONDUIT or electrical metallic tubing may be manufactured on the Coast following a move April 15 of Andersen-Carlson Mfg. Co., Torrance, Calif., under an agreement with Rome Cable Corp. of Rome, New York, to start production early this summer. The Rome corporation becomes interested in the Western company. Sales of the tubing will be handled through Rome Cable sales outlets. Pacific Electro Sales Inc., with offices and warehouses in Los Angeles, San Francisco, and Seattle, will act as agents in the West. F. R. Weaver, South Laguna Beach, Calif., formerly associated with Rome Cable Corp., has been elected to the Andersen-Carlson board of directors.

● R. E. MCDONOUGH, manager of Monitor Home Appliances Inc. at 604 Utah Ave., Butte, Mont., announces that, in addition to the Monitor home appliances, his company will handle lighting fixtures of Guth, Pittsburgh, Sunbeam of Los Angeles, Ward-Monterey and Colonial Premier lamps. They will also handle Moloney transformers, Frank Adam switchboards, Matthews pole line equipment, General Mills appliances, and Lightolier home lighting equipment. John Hawkins, former G-E representative in Billings, has joined the firm recently.

● STRAND ELECTRIC CO., Salt Lake City, is adding a 50x70-ft. building which will give it 4,000 sq. ft. of storage in the rear of its contracting and appliance stores. The two stores now occupy 3,000 sq. ft. Appliances were added a year and a half ago. The Gibson line and Delco furnaces are the two featured lines, with other appliances carried also. Strand Electric also has the state agency for the Flash Call intercommunication system.

● PUEBLO ELECTRIC SUPPLY CO. Inc. is a new wholesale supply house just opened at 131 Spring St., Pueblo, Colo. Joseph H. Edwards and Lester A. Johnson, both formerly with Sylvania Electric Products in Omaha, Neb., are proprietors of the new supply house.

● FRED RICHMAN and KENNETH ROSS have formed the Mt. Rose Appliance Co. located on S. Virginia St. in Reno. They were both formerly in the service department of Sierra Pacific Power Co.

● NANAIMO MACHINERY ELECTRIC Ltd., with registered offices in Vancouver, B. C., has become incorporated.

● H. KOSASKY recently bought the business of Johnson's Radio and Electric in North Vancouver, B. C.

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Amazing
SCIENTIFICALLY DESIGNED
FUSE LINK
Keeps
EQUIPMENT OPERATING
during safe loads
(100% to 200%)
Blow points are accurately computed. Extra surface area carries away heat. Ruggedly built tubular bridge and screen ventilated case contributes to its efficiency and lasting good value.

FREE: Balanced Lag Link to inspect and test. Specify amperage, voltage.

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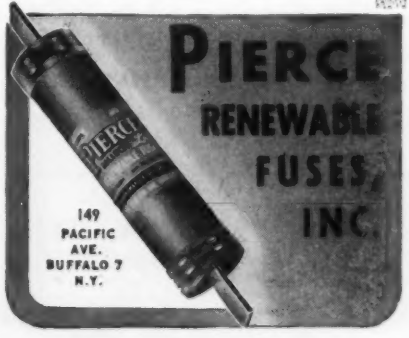
2038 Bay St., Los Angeles 21
3401 Fourth Ave. South, Seattle
NORTHWEST SALES CO.
1603 N. W. Johnson St.
Portland 9, Oregon
SLAYBAUGH-THOMPSON CO.
617 Gilpin St., Denver 3, Colo.



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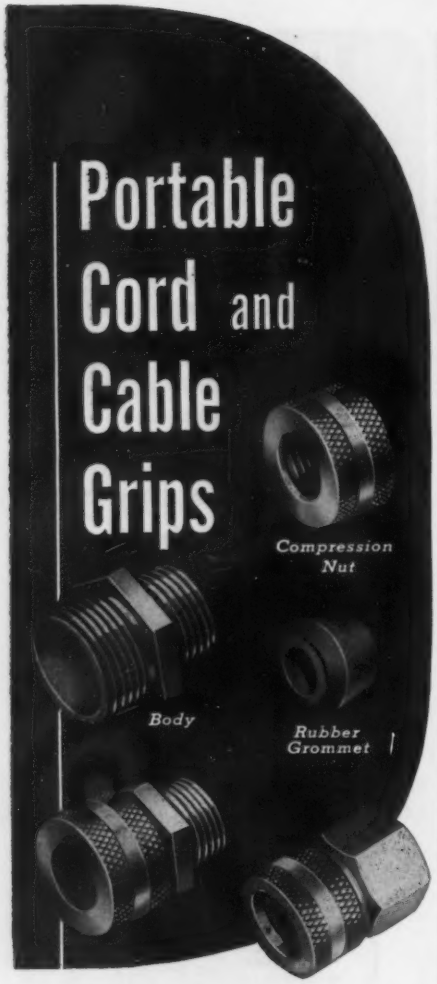


Cord and cable grips for portable wiring offer a complete line of substantially built fittings for heavy duty service. The standard types shown have aluminum body, aluminum compression nut, and single hole rubber grommet. Two and three hole grommets can also be furnished.

Angle types are available; also female bodies with or without chase nipples; also with serrated body for mounting in sheet metal panels or cabinets.

Compression nuts with split clamp, with hose attachment, with extended handle, or with cord protecting spring are available. Couplings for flexible conduit can be supplied.

Consult your Pylet Catalog 1100 for complete listings.

THE PYLE-NATIONAL COMPANY

1364 N. Kostner Avenue, Chicago 51, Ill.

Pacific Coast Sales Office
1302 Hobart Bldg., San Francisco 4

● CHANGES in personnel of the Vancouver office of the Canadian General Electric Co. have been reported. Richard Hamilton, formerly in the appliance department, has been appointed sales engineer in the apparatus department. Richard Gladden succeeds him in the appliance department. Fern Colvin has been named to cover the Fraser Valley territory and New Westminster for the company on major appliances. Robert Williams has assumed his duties as advertising and publicity representative for the Vancouver office. Duff Tapin has been appointed general assistant in the appliance division at Vancouver, and Harold Hume has joined the staff of the company as sales specialist on electronic equipment.

● ORMONDE SMITH Jr. has joined the sales and service staff of C. C. Musgrove, sales representatives for the Pacific Electric Mfg. Corp., San Francisco, manufacturers of high-voltage switching equipment. Smith will take care of sales and service for the new Houston headquarters recently opened at 3842 Palm Ave., while C. C. Musgrove will continue working from his present location at 508 Southland Life Annex Bldg., Dallas.

● JAMES A. WARREN Jr. has been named Kelvinator zone manager at Oakland, it was announced recently by C. T. Lawson, vice-president in charge of Kelvinator sales, Nash-Kelvinator Corp. C. J. Bachman, Pacific Coast regional manager for the firm, announced that the company's Pacific regional and Oakland zone offices are located in a new building at 2325 E. 12th St., Oakland.

● APPLIANCE WHOLESALERS has changed its name to the Walter B. Lloyd Co. This firm is located at 850 S. Main St., Salt Lake City.

● KIRK-PALKA Co. will open an office at 420 Market St., San Francisco, according to Bill Kirk. The office will be headed by Fred J. Nemeth.

● E. AND S. DONNER have taken over the Palmer's Hardware in the Dunbar St. district, Vancouver, B. C., and have secured the General Electric franchise. They formerly operated Donner's Furniture Co. at Vancouver.

● BELL'S ELECTRIC LTD., Vancouver, B. C., electrical and radio dealers, has become incorporated with registered offices at 2141 West 41st Ave.

● WALTER FENN Jr. has opened a new electric and radio business in Mission, B. C., to be known as Fenn Electric. For the past 14 years Fenn has been employed as a radio technician and electrical service man in Mission.

● ARCHIE MARSDEN has opened a combination showroom, kitchen-laundry display and supply headquarters for General Electric Appliance Corp., at 1764 Kettner Blvd., San Diego.

DIRECTORY ADDITIONS

For the convenience of those who wish to keep the Directory Issue up-to-date, ELECTRICAL WEST will publish monthly additions and changes announced after the April 1948 edition went to press. This will include the directory of manufacturers, their Western offices and sales representatives; the directory of appliance service and repair parts, and the directory of manufacturers' representatives in the West. Please add the following:

DIRECTORY OF MANUFACTURERS

CABLE ELECTRIC PRODUCTS INC., Brooklyn, N. Y.—Frank H. Bran Co., Los Angeles and San Francisco.

INSULATION & WIRES INC., St. Louis, Mo.—Branch office: 1702 N.W. Sandy Blvd., Portland, Ore.

KNAPP-MONARCH CO., St. Louis, Mo.—John Frost, Vancouver, B. C.

PIERCE RENEWABLE FUSES INC., Buffalo, N. Y.—Pacific Electro Sales Inc., 1045 Bryant St., San Francisco, 2038 Bay St., Los Angeles, 3401 4th Ave. S., Seattle; Northwest Sales Co., 1603 N.W. Johnston St., Portland; Slaybaugh-Thompson Co., 617 Gilpin St., Denver.

ROME CABLE CORP., Rome, N. Y.—H. L. Rawlings, Pacific Electro Sales Inc., Salt Lake City.

WESTINGHOUSE ELECTRIC CORP., Pittsburgh, Pa.—Raymond M. Johnson, Medford, Ore.

DIRECTORY OF APPLIANCE SERVICE AND REPAIR PARTS

W. H. BRADY CO., Milwaukee, Wis.—Distributor: Electrical Specialty Co. (Offices in Los Angeles, San Francisco, Portland, Seattle, Denver). Distributor in eleven Western States.

DEEPFREEZE, DIV. OF MOTOR PRODUCTS CORP., N. Chicago, Ill.—Distributor: J. E. Redmond Supply Co., 402 W. Madison St., Phoenix, Ariz.

YALE & TOWNE MFG. CO., Philadelphia Pa.—Distributor: McCormack & Co., 45[illegible] 9th St., San Francisco.

BENDIX HOME APPLIANCES INC., South Bend, Ind.—Distributor: Taylor Distributing Co., Billings, Mont. (includes ten northern counties of Wyoming).

DIRECTORY OF WESTERN REPRESENTATIVES

LOS ANGELES, CALIF.: Reliance Sales Co., 440 S. Alameda St.

SAN FRANCISCO, CALIF.: C. E. Ingalls and his sons, Robert E. and Donald E., 541 Monadnock Bldg.

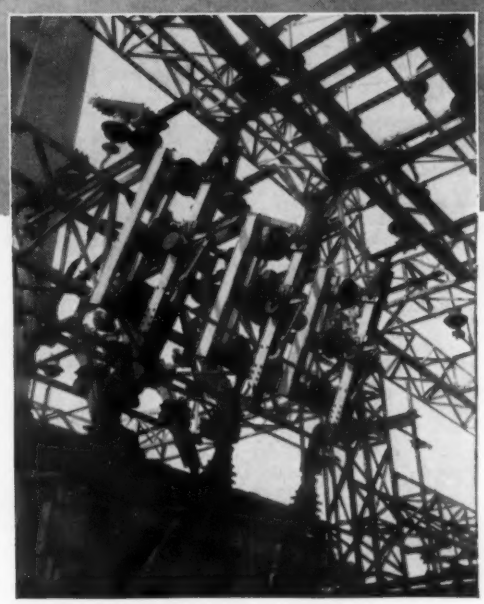
BUILT TO TAKE IT!

Southern States Type CHH Outdoor, Group Operated, High Pressure Switch Available in Voltage Ratings of 15 and 23KV, Current Ratings of 2,000, 3,000 and 4,000 Amps.

High pressure contact is assured by pre-compressed stainless steel back-up springs in weather-proof bronze housings. Solid silver contacts at both hinge and jaw retard corrosive deterioration and provide a low resistance current path under all conditions. The faces of these silver contacts are curved to give the most effective wiping action.

The blade operating mechanism is composed of simple mechanical linkages with fixed bearings. Low in friction, it produces its greatest mechanical advantage at the instant of contact engagement.

All conducting members of this switch are of solid bus copper or silver. The straight line current path materially reduces mechanical and electrical stresses induced by heavy currents under short circuit conditions. The CHH is "built to take it."



Here is a typical installation of the Type CHH Switch in the switch yard of a large southeastern operating plant. Subject to atmosphere contaminated by gases and fly ash, the CHH has been in continuous operation in this yard, under heavy load conditions, for a number of years. A recent examination of contacts shows them to be in perfect condition.

Southern States Equipment Corp.

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SAN FRANCISCO, CALIFORNIA	BOSTON, MASSACHUSETTS	MEMPHIS, TENNESSEE
DENVER, COLORADO	JACKSON, MICHIGAN	DALLAS, TEXAS
WASHINGTON, D. C.	KANSAS CITY, MISSOURI	HOUSTON, TEXAS
JACKSONVILLE, FLORIDA	NEW YORK, NEW YORK	LUBBOCK, TEXAS
MIAMI, FLORIDA	CHARLOTTE, NORTH CAROLINA	SALT LAKE CITY, UTAH
ATLANTA, GEORGIA	CLEVELAND, OHIO	RICHMOND, VIRGINIA
EVANSVILLE, INDIANA	PHILADELPHIA, PENNSYLVANIA	SEATTLE, WASHINGTON
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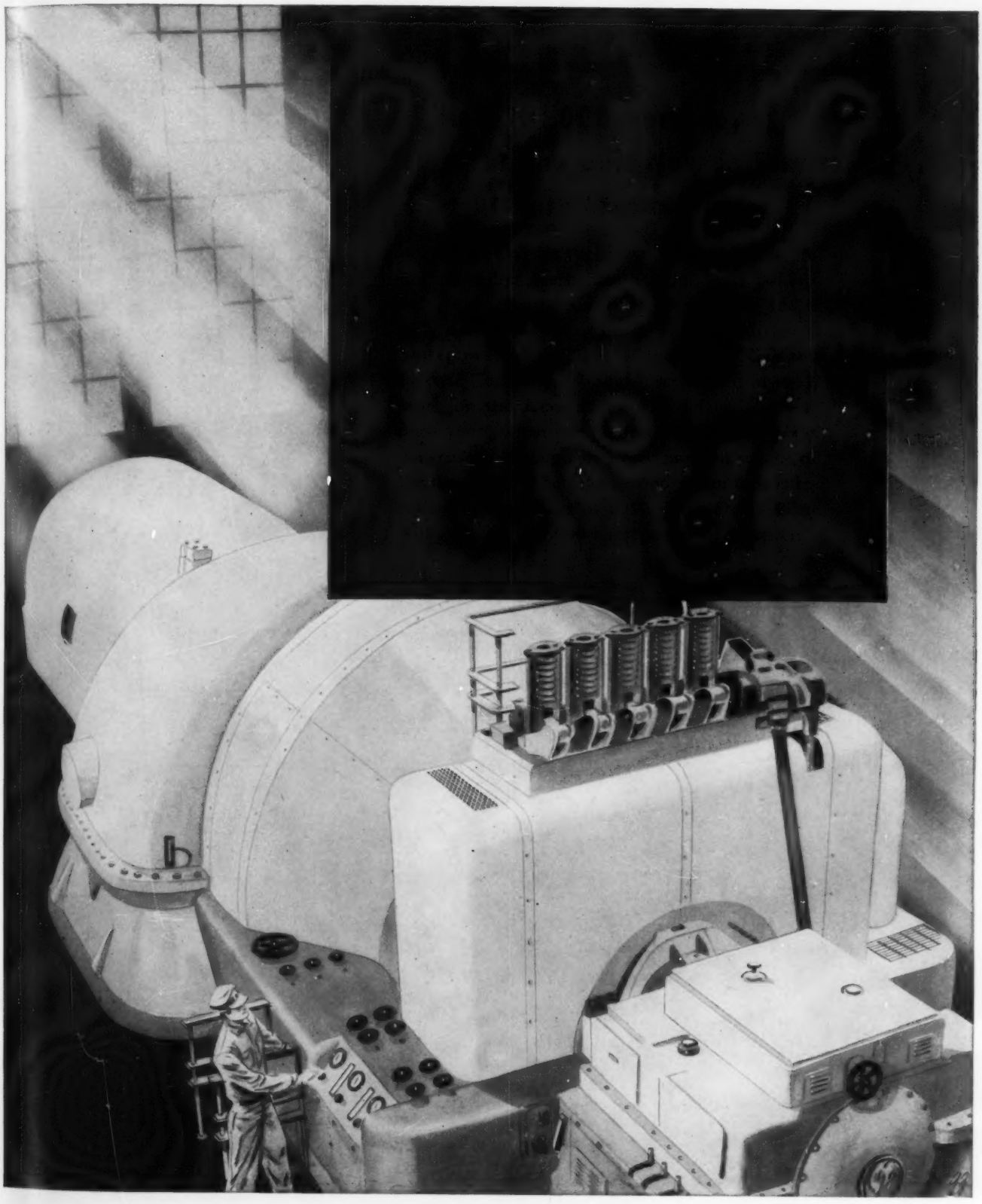
PROFILES

William P. Reilly (right) last month was named Arizona Power Co. president, succeeding J. C. Tucker. He formerly headed Ebasco's Washington office

R. W. Staud (center) of Benjamin Electric, IES president, was honored by Southern California Section, IES, at Los Angeles. L. A. Hobbs, Smoot-Holman Co, Inglewood, made the introduction

Pictured at opening of B. C. Electric's $1,000,000 Kidd substation (bottom) are: W. G. Murrin, past president B. C. Electric; George Kidd, first president of company, for whom station is named; Acting Mayor George Miller of Vancouver; B. C. Electric president, A. E. Grauer; Thomas Ingledow, chief engr.



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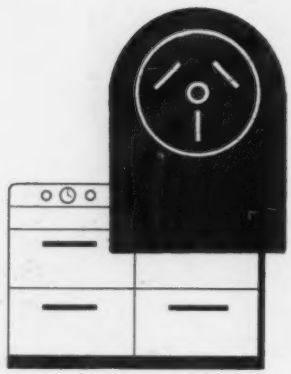
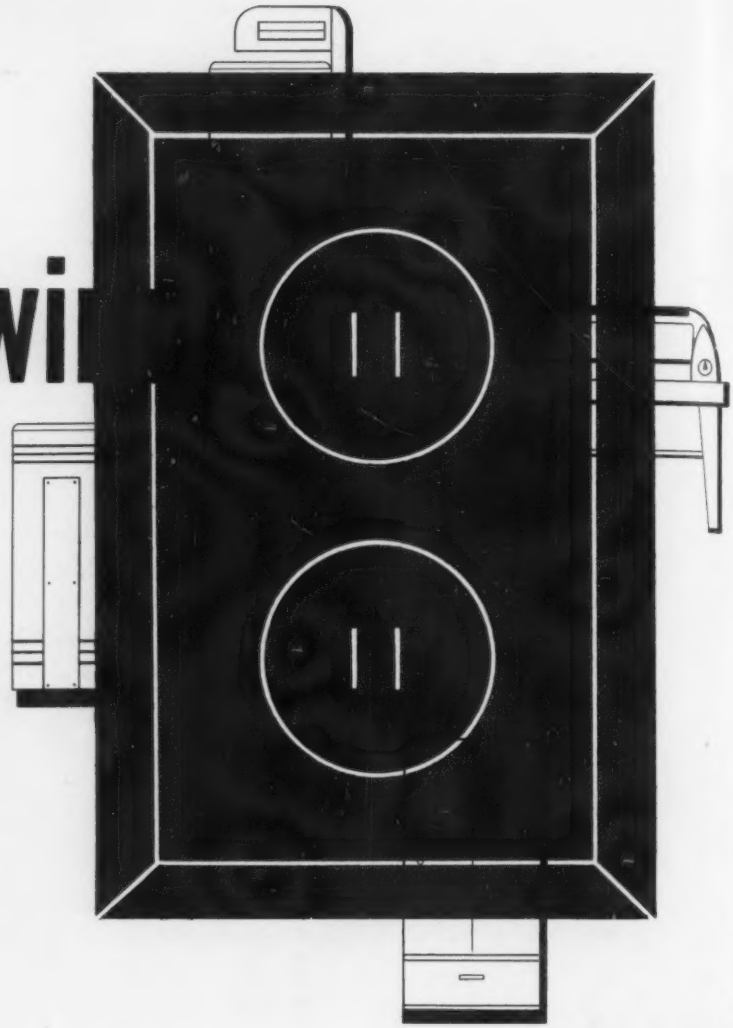




turns a stumbling block

into a stepping stone!

Every appliance dealer has had this happen: A sale of a major appliance blocked at the point of closing by costly or troublesome installation requirements. There's a good bridge to cross before you come to it! Adequate Wiring eliminates the stumbling block, substitutes a stepping stone.

Adequate Wiring is one of your best aids to selling, in at least two ways. It makes installation of new appliances easy and inexpensive. After the sale, adequate wiring, delivering full power at every outlet, makes appliances operate efficiently, *keeps* them sold. Your customer gets satisfaction, your best stepping stone to further sales.

PACIFIC COAST ELECTRICAL ASSOCIATION

601 West Fifth Street, Los Angeles 13, Calif. • 447 Sutter Street, San Francisco 8, Calif.

ELECTRICAL WEST

June 1948
25 cents

16th Annual Convention-In-Print

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

EDISON CUSTOMERS ARE IN THE MARKET FOR $25,000,000 WORTH OF *Ranges* AND *Water Heaters* AND THEY MEAN BUSINESS

Edison territory has been growing at the rate of 5,000 new homes every month since V-J Day. Together with replacement figures of 40,000 ranges and 60,000 water heaters annually, that adds up to a tremendous market waiting to be tapped by Southern California appliance dealers.

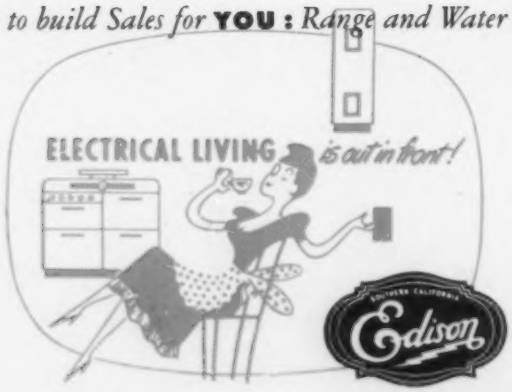
These customers have had a long wait. They have been watching Edison advertising for the signal that electric ranges and water heaters are available. And now that dealer stocks are adequate, Edison will spread the welcome news.

It's the biggest opportunity you've had in years to cash in with big sales—big profits. Remember "Edison tells them, and the dealer sells them!"

DO YOUR PART—GET YOUR SHARE

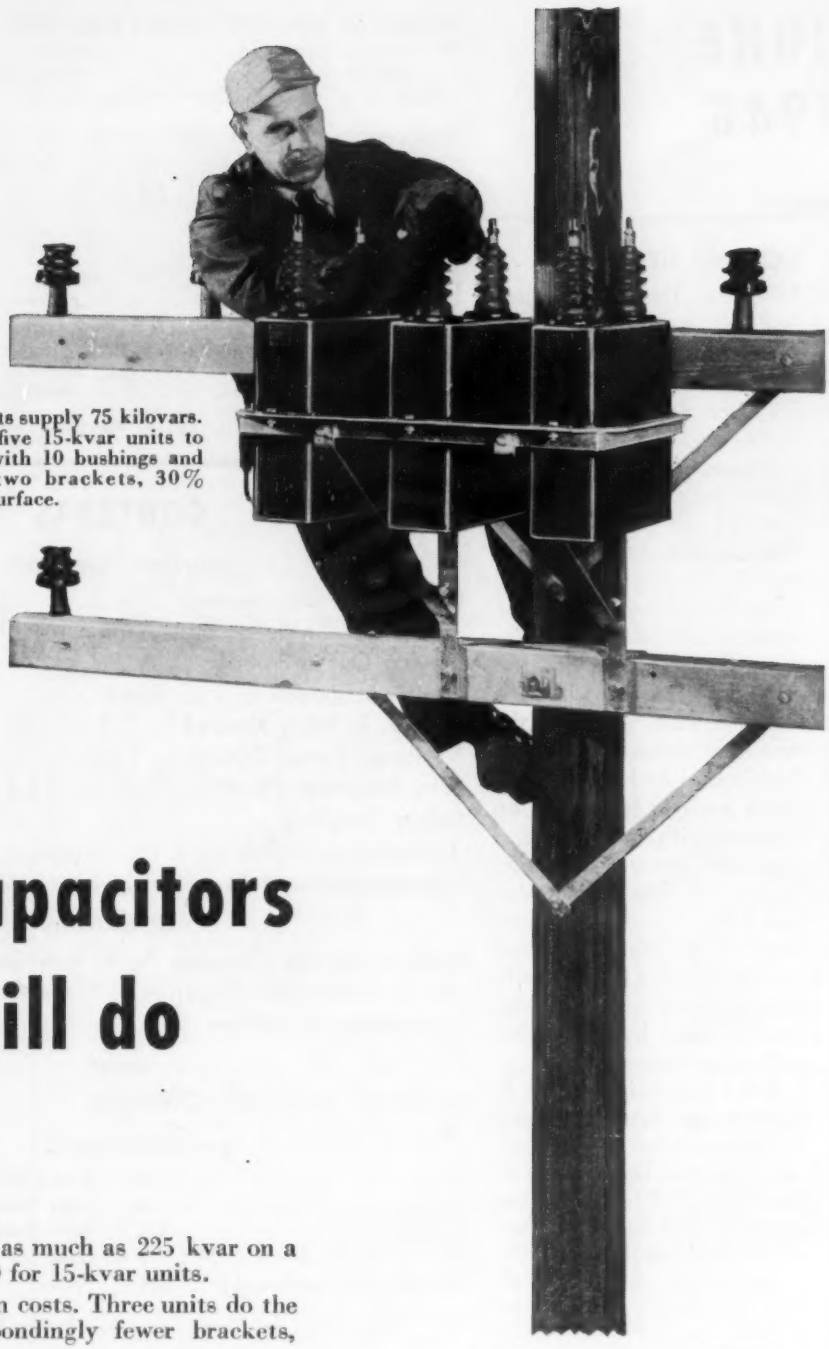
to build Sales for **YOU** *: Range and Water Heater Campaign begins June 1st*

- **Newspaper ads**
- **Magazine ads**
- **Window and store displays**
- **Merchandise tags**
- **Direct Mail**
- **Sales Manuals**



See Dealers News or your Edison office for details

SOUTHERN CALIFORNIA EDISON COMPANY



These three units supply 75 kilovars. It would take five 15-kvar units to equal them—with 10 bushings and connections, two brackets, 30% more exposed surface.

why use 5 capacitors when 3 will do ?

25-kvar capacitors permit installation of as much as 225 kvar on a single pair of crossarms—compared to 180 for 15-kvar units.

25-kvar capacitors mean lower installation costs. Three units do the job of five 15-kvar units—with correspondingly fewer brackets, bushings, connections.

25-kvar capacitors have glass bushings hermetically sealed to the resistance-welded drawn-steel cases, Pyranol*, and other G-E features that mean maximum dependability.

25-kvar capacitors are stock items available for immediate shipment. A General Electric specialist can give you full information. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*

*Reg. U. S. Pat. Off.

ALREADY...

Over 150,000 kvar of 25-kvar capacitors have been ordered by some 25 electric utilities in 20 states.

GENERAL ELECTRIC